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Section II – Soil and Site Information

**County specific computer generated reports.*

ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS

Labette County, Kansas: Published

Map symbol	Soil name	Acres	Percent
021ES	Eram-Shidler Silty Clay Loams, 4 To 12 Percent Slopes	61	*
125BF	Bates-Collinsville Complex, 1 To 4 Percent Slopes	10	*
Ae	Apperson Silty Clay Loam, 1 To 3 Percent Slopes	39,325	9.4
AED	Arents, Earthen Dam	34	*
Be	Bates Loam, 1 To 3 Percent Slopes	11,064	2.6
Bf	Bates Loam, 3 To 7 Percent Slopes	3,559	0.9
Bm	Bates-Collinsville Complex, 4 To 15 Percent Slopes	6,053	1.4
Bo	Bolivar-Hector Fine Sandy Loams, 4 To 20 Percent Slopes	3,844	0.9
Br	Brazilton Silty Clay Loam, 1 To 4 Percent Slopes	533	0.1
Cd	Catoosa Silt Loam, 0 To 2 Percent Slopes	32,859	7.9
Ch	Cherokee Silt Loam, 0 To 1 Percent Slopes	17,601	4.2
De	Dennis Silt Loam, 1 To 3 Percent Slopes	42,819	10.2
Ef	Eram Silty Clay Loam, 1 To 3 Percent Slopes	15,912	3.8
Eh	Eram Silty Clay Loam, 3 To 7 Percent Slopes	14,291	3.4
Eo	Eram-Lebo Silty Clay Loams, 4 To 20 Percent Slopes	2,726	0.7
Es	Eram-Nowata Complex, 2 To 7 Percent Slopes	2,945	0.7
He	Hepler Silt Loam, Occasionally Flooded	10,999	2.6
HF	Hepler Silt Loam, Frequently Flooded	132	*
Ka	Kanima Silty Clay Loam, 3 To 7 Percent Slopes	115	*
Kb	Kanima Silty Clay Loam, 10 To 30 Percent Slopes	376	*
Ke	Kenoma Silt Loam, 1 To 3 Percent Slopes	41,800	10.0
Ln	Lanton Silt Loam, Occasionally Flooded	18,972	4.5
M-W	Miscellaneous Water	148	*
Od	Olpe-Dennis Silt Loams, 3 To 7 Percent Slopes	1,258	0.3
Or	Orthents, Clayey	3,509	0.8
Os	Osage Silty Clay, Occasionally Flooded	9,828	2.4
Pe	Parsons Silt Loam, 0 To 2 Percent Slopes	49,100	11.7
Pt	Pits, Quarries	548	0.1
Sd	Shidler-Catoosa Silt Loams, 1 To 8 Percent Slopes	26,464	6.3
Vc	Verdigris Silt Loam, Frequently Flooded	14,293	3.4
Vf	Verdigris Silt Loam, Occasionally Flooded	8,824	2.1
W	Water	3,193	0.8
Zb	Zaar Silty Clay, 0 To 2 Percent Slopes	34,789	8.3
	Total	417,984	100.0

* Less than 0.1 percent.

NONTECHNICAL SOIL DESCRIPTIONS
Labette County, Kansas

Nontechnical soil descriptions describe soil properties or management considerations specific to a soil map unit or group of map units, shown in the NonTechnical Descriptions report. These descriptions are written in terminology that Non-technical users of soil survey information can understand.
Nontechnical soil descriptions are a powerful tool for creating reports. These high quality, easy to read reports can be generated by conservation planners and other NRCS employees for distribution to land users. Soil map unit descriptions and National Soil Information System records are the basis for these descriptions.

021ES Eram-Shidler Silty Clay Loams, 4 To 12 Percent Slopes

Eram soil makes up 50 percent of the map unit. This map unit is in the Cherokee Prairies Major Land Resource Area. This soil occurs on a moderately sloping to strongly sloping backslope ridge on upland. The runoff class is very high. The parent material consists of silty and clayey residuum weathered from shale, unspecified. The soil is 20 to 40 inches deep to bedrock (paralithic). This soil is moderately well drained. The slowest permeability is slow. It has a low available water capacity and a low shrink swell potential. This soil is not flooded and is not ponded. The top of the seasonal high water table is at 8 inches. This soil is in the Clay Upland (pe35-42) range site. It is in the nonirrigated land capability classification 6e.

Shidler soil makes up 40 percent of the map unit. This map unit is in the Cherokee Prairies Major Land Resource Area. This soil occurs on a moderately sloping to strongly sloping backslope hillslope on upland. The runoff class is high. The parent material consists of residuum weathered from limestone. The soil is 10 to 20 inches deep to bedrock (lithic). This soil is well drained. The slowest permeability is moderately slow. It has a very low available water capacity and a moderate shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. This soil is in the Shallow Limy (pe35-42) range site. It is in the nonirrigated land capability classification 7s.

125BF Bates-Collinsville Complex, 1 To 4 Percent Slopes

Bates soil makes up 50 percent of the map unit. This map unit is in the Cherokee Prairies Major Land Resource Area. This soil occurs on a gently sloping to moderately sloping summit ridge on upland. The runoff class is medium. The parent material consists of sandy and silty residuum weathered from sandstone, unspecified over sandy and silty residuum weathered from sandstone-shale. The soil is 20 to 40 inches deep to bedrock (paralithic). This soil is well drained. The slowest permeability is moderately slow. It has a low available water capacity and a moderate shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. This soil is in the Loamy Upland (pe35-42) range site. It is in the nonirrigated land capability classification 4e.

Collinsville soil makes up 40 percent of the map unit. This map unit is in the Cherokee Prairies Major Land Resource Area. This soil occurs on a gently sloping to moderately sloping backslope ridge on upland. The runoff class is very low. The parent material consists of sandstone residuum. The soil is 4 to 20 inches deep to bedrock (lithic). This soil is well drained. The slowest permeability is moderately rapid. It has a very low available water capacity and a low shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. This soil is in the Shallow Sandstone (pe35-42) range site. It is in the nonirrigated land capability classification 6e.

Ae Apperson Silty Clay Loam, 1 To 3 Percent Slopes

Apperson soil makes up 85 percent of the map unit. This map unit is in the Cherokee Prairies Major Land Resource Area. This soil occurs on a gently sloping summit ridge on upland. The runoff class is medium. The parent material consists of residuum weathered from limestone. The soil is 40 to 60 inches deep to bedrock (lithic). This soil is moderately well drained. The slowest permeability is slow. It has a moderate available water capacity and a very high shrink swell potential. This soil is not flooded and is not ponded. The top of the seasonal high water table is at 15 inches. This soil is in the Loamy Upland (pe35-42) range site. It is in the nonirrigated land capability classification 2e.

Be Bates Loam, 1 To 3 Percent Slopes

Bates soil makes up 85 percent of the map unit. This map unit is in the Cherokee Prairies Major Land Resource Area. This soil occurs on a gently sloping summit hillslope on upland. The runoff class is medium. The parent material consists of sandy and silty residuum weathered from sandstone, unspecified over sandy and silty residuum weathered from sandstone-shale. The soil is 20 to 40 inches deep to bedrock (paralithic). This soil is well drained. The slowest permeability is moderately slow. It has a low available water capacity and a moderate shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. This soil is in the Loamy Upland (pe35-42) range site. It is in the nonirrigated land capability classification 2e.

Bf Bates Loam, 3 To 7 Percent Slopes

Bates soil makes up 85 percent of the map unit. This map unit is in the Cherokee Prairies Major Land Resource Area. This soil occurs on a moderately sloping backslope hillslope on upland. The runoff class is medium. The parent material consists of sandy and silty residuum weathered from sandstone, unspecified over sandy and silty residuum weathered from sandstone-shale. The soil is 20 to 40 inches deep to bedrock (paralithic). This soil is well drained. The slowest permeability is moderately slow. It has a low available water capacity and a moderate shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. This soil is in the Loamy Upland (pe35-42) range site. It is in the nonirrigated land capability classification 3e.

Bm Bates–Collinsville Complex, 4 To 15 Percent Slopes

Bates soil makes up 50 percent of the map unit. This map unit is in the Cherokee Prairies Major Land Resource Area. This soil occurs on a moderately sloping to strongly sloping backslope hillslope on upland. The runoff class is medium. The parent material consists of sandy and silty residuum weathered from sandstone, unspecified over sandy and silty residuum weathered from sandstone–shale. The soil is 20 to 40 inches deep to bedrock (paralithic). This soil is well drained. The slowest permeability is moderately slow. It has a low available water capacity and a moderate shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. This soil is in the Loamy Upland (pe35–42) range site. It is in the nonirrigated land capability classification 6e.

Collinsville soil makes up 35 percent of the map unit. This map unit is in the Cherokee Prairies Major Land Resource Area. This soil occurs on a moderately sloping to moderately steep shoulder hillslope on upland. The runoff class is low. The parent material consists of sandstone residuum. The soil is 4 to 20 inches deep to bedrock (lithic). This soil is well drained. The slowest permeability is moderately rapid. It has a very low available water capacity and a low shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. This soil is in the Shallow Sandstone (pe35–42) range site. It is in the nonirrigated land capability classification 6e.

Bo Bolivar–Hector Fine Sandy Loams, 4 To 20 Percent Slopes

Bolivar soil makes up 65 percent of the map unit. This map unit is in the Cherokee Prairies Major Land Resource Area. This soil occurs on a moderately sloping to moderately steep summit ridge on upland. The runoff class is medium. The parent material consists of residuum weathered from sandstone. The soil is 20 to 40 inches deep to bedrock (paralithic). This soil is well drained. The slowest permeability is moderate. It has a low available water capacity and a moderate shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. This soil is in the Savannah (pe35–42) range site. It is in the nonirrigated land capability classification 6e.

Hector soil makes up 25 percent of the map unit. This map unit is in the Cherokee Prairies Major Land Resource Area. This soil occurs on a moderately sloping to moderately steep backslope ridge on upland. The runoff class is low. The parent material consists of residuum weathered from sandstone. The soil is 10 to 20 inches deep to bedrock (lithic). This soil is well drained. The slowest permeability is moderately rapid. It has a very low available water capacity and a low shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. This soil is in the Shallow Savannah (pe35–42) range site. It is in the nonirrigated land capability classification 7e.

Br Brazilton Silty Clay Loam, 1 To 4 Percent Slopes

Brazilton soil makes up 100 percent of the map unit. This map unit is in the Cherokee Prairies Major Land Resource Area. This soil occurs on a gently sloping to moderately sloping backslope hillslope on upland. The runoff class is very high. The parent material consists of mine spoil or earthy fill. This soil is moderately well drained. The slowest permeability is very slow. It has a moderate available water capacity and a moderate shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. This soil contains a very slightly saline horizon, It is in the nonirrigated land capability classification 3e.

Cd Catoosa Silt Loam, 0 To 2 Percent Slopes

Catoosa soil makes up 90 percent of the map unit. This map unit is in the Cherokee Prairies Major Land Resource Area. This soil occurs on a gently sloping summit ridge on upland. The runoff class is medium. The parent material consists of residuum weathered from limestone. The soil is 20 to 40 inches deep to bedrock (lithic). This soil is well drained. The slowest permeability is moderately slow. It has a low available water capacity and a high shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. This soil is in the Loamy Upland (pe35–42) range site. It is in the nonirrigated land capability classification 2e.

Ch Cherokee Silt Loam, 0 To 1 Percent Slopes

Cherokee soil makes up 100 percent of the map unit. This map unit is in the Cherokee Prairies Major Land Resource Area. This soil occurs on a nearly level summit paleoterrace on upland. The runoff class is medium. The parent material consists of loess over ancient clayey alluvium. This soil is somewhat poorly drained. The slowest permeability is very slow. It has a moderate available water capacity and a very high shrink swell potential. This soil is not flooded and is not ponded. The top of the seasonal high water table is at 12 inches. This soil is in the Clay Upland (pe35–42) range site. It is in the nonirrigated land capability classification 2s.

De Dennis Silt Loam, 1 To 3 Percent Slopes

Dennis soil makes up 90 percent of the map unit. This map unit is in the Cherokee Prairies Major Land Resource Area. This soil occurs on a gently sloping backslope hillslope on upland. The runoff class is high. The parent material consists of silty and clayey residuum weathered from shale, unspecified. This soil is moderately well drained. The slowest permeability is slow. It has a high available water capacity and a very high shrink swell potential. This soil is not flooded and is not ponded. The top of the seasonal high water table is at 15 inches. This soil is in the Loamy Upland (pe35–42) range site. It is in the nonirrigated land capability classification 2e.

Ef Eram Silty Clay Loam, 1 To 3 Percent Slopes

Eram soil makes up 85 percent of the map unit. This map unit is in the Cherokee Prairies Major Land Resource Area. This soil occurs on a gently sloping backslope hillslope on upland. The runoff class is high. The parent material consists of silty and clayey residuum weathered from shale, unspecified. The soil is 20 to 40 inches deep to bedrock (paralithic). This soil is moderately well drained. The slowest permeability is slow. It has a low available water capacity and a high shrink swell potential. This soil is not flooded and is not ponded. The top of the seasonal high water table is at 12 inches. This soil is in the Clay Upland (pe35-42) range site. It is in the nonirrigated land capability classification 3e.

Eh Eram Silty Clay Loam, 3 To 7 Percent Slopes

Eram soil makes up 88 percent of the map unit. This map unit is in the Cherokee Prairies Major Land Resource Area. This soil occurs on a moderately sloping backslope hillslope on upland. The runoff class is very high. The parent material consists of silty and clayey residuum weathered from shale, unspecified. The soil is 20 to 40 inches deep to bedrock (paralithic). This soil is moderately well drained. The slowest permeability is slow. It has a low available water capacity and a high shrink swell potential. This soil is not flooded and is not ponded. The top of the seasonal high water table is at 12 inches. This soil is in the Clay Upland (pe35-42) range site. It is in the nonirrigated land capability classification 4e.

Eo Eram-Lebo Silty Clay Loams, 4 To 20 Percent Slopes

Eram soil makes up 60 percent of the map unit. This map unit is in the Cherokee Prairies Major Land Resource Area. This soil occurs on a moderately sloping to strongly sloping backslope hillslope on upland. The runoff class is very high. The parent material consists of silty and clayey residuum weathered from shale, unspecified. The soil is 20 to 40 inches deep to bedrock (paralithic). This soil is moderately well drained. The slowest permeability is slow. It has a low available water capacity and a high shrink swell potential. This soil is not flooded and is not ponded. The top of the seasonal high water table is at 12 inches. This soil is in the Clay Upland (pe35-42) range site. It is in the nonirrigated land capability classification 6e.

Lebo soil makes up 20 percent of the map unit. This map unit is in the Cherokee Prairies Major Land Resource Area. This soil occurs on a strongly sloping to moderately steep backslope hillslope on upland. The runoff class is medium. The parent material consists of residuum weathered from shale, clayey. The soil is 20 to 40 inches deep to bedrock (paralithic). This soil is well drained. The slowest permeability is moderate. It has a low available water capacity and a moderate shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. This soil is in the Loamy Upland (pe35-42) range site. It is in the nonirrigated land capability classification 6e.

Es Eram-Nowata Complex, 2 To 7 Percent Slopes

Eram soil makes up 50 percent of the map unit. This map unit is in the Cherokee Prairies Major Land Resource Area. This soil occurs on a gently sloping to moderately sloping backslope hillslope on upland. The runoff class is very high. The parent material consists of silty and clayey residuum weathered from shale, unspecified. The soil is 20 to 40 inches deep to bedrock (paralithic). This soil is moderately well drained. The slowest permeability is slow. It has a low available water capacity and a high shrink swell potential. This soil is not flooded and is not ponded. The top of the seasonal high water table is at 12 inches. This soil is in the Clay Upland (pe35-42) range site. It is in the nonirrigated land capability classification 4e.

Nowata soil makes up 30 percent of the map unit. This map unit is in the Cherokee Prairies Major Land Resource Area. This soil occurs on a gently sloping to moderately sloping backslope ridge on upland. The runoff class is high. The parent material consists of residuum weathered from limestone. The soil is 20 to 40 inches deep to bedrock (lithic). This soil is well drained. The slowest permeability is moderately slow. It has a low available water capacity and a moderate shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. This soil is in the Loamy Upland (pe35-42) range site. It is in the nonirrigated land capability classification 4e.

He Hepler Silt Loam, Occasionally Flooded

Hepler soil makes up 95 percent of the map unit. This map unit is in the Cherokee Prairies Major Land Resource Area. This soil occurs on a nearly level to gently sloping flood plain on river valley. The runoff class is low. The parent material consists of silty alluvium. This soil is somewhat poorly drained. The slowest permeability is moderately slow. It has a high available water capacity and a moderate shrink swell potential. This soil is occasionally flooded and is not ponded. The top of the seasonal high water table is at 24 inches. This soil is in the Loamy Lowland (pe35-42) range site. It is in the nonirrigated land capability classification 2w.

HF Hepler Silt Loam, Frequently Flooded

Hepler soil makes up 95 percent of the map unit. This map unit is in the Cherokee Prairies Major Land Resource Area. This soil occurs on a nearly level to gently sloping flood plain on river valley. The runoff class is low. The parent material consists of silty alluvium. This soil is somewhat poorly drained. The slowest permeability is moderately slow. It has a very high available water capacity and a moderate shrink swell potential. This soil is frequently flooded and is not ponded. The top of the seasonal high water table is at 24 inches. This soil is in the Loamy Lowland (pe35-42) range site. It is in the nonirrigated land capability classification 5w.

Ka Kanima Silty Clay Loam, 3 To 7 Percent Slopes

Kanima soil makes up 100 percent of the map unit. This map unit is in the Cherokee Prairies Major Land Resource Area. This soil occurs on a moderately sloping backslope hillslope on upland. The runoff class is medium. The parent material consists of mine spoil or earthy fill. This soil is well drained. The slowest permeability is moderate. It has a low available water capacity and a moderate shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. It is in the nonirrigated land capability classification 6s.

Kb Kanima Silty Clay Loam, 10 To 30 Percent Slopes

Kanima soil makes up 95 percent of the map unit. This map unit is in the Cherokee Prairies Major Land Resource Area. This soil occurs on a strongly sloping to steep backslope hillslope on upland. The runoff class is high. The parent material consists of mine spoil or earthy fill. This soil is well drained. The slowest permeability is moderate. It has a low available water capacity and a moderate shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. It is in the nonirrigated land capability classification 7s.

Ke Kenoma Silt Loam, 1 To 3 Percent Slopes

Kenoma soil makes up 85 percent of the map unit. This map unit is in the Cherokee Prairies Major Land Resource Area. This soil occurs on a gently sloping backslope hillslope on upland. The runoff class is high. The parent material consists of loess over ancient clayey alluvium and/or residuum weathered from limestone and shale. This soil is moderately well drained. The slowest permeability is very slow. It has a high available water capacity and a very high shrink swell potential. This soil is not flooded and is not ponded. The top of the seasonal high water table is at 12 inches. This soil contains a very slightly saline horizon, This soil is in the Clay Upland (pe35-42) range site. It is in the nonirrigated land capability classification 3e.

Ln Lanton Silt Loam, Occasionally Flooded

Lanton soil makes up 95 percent of the map unit. This map unit is in the Cherokee Prairies Major Land Resource Area. This soil occurs on a nearly level to gently sloping flood plain on river valley. The runoff class is medium. The parent material consists of silty and clayey alluvium. This soil is somewhat poorly drained. The slowest permeability is slow. It has a high available water capacity and a moderate shrink swell potential. This soil is occasionally flooded and is not ponded. The top of the seasonal high water table is at 18 inches. This soil is in the Loamy Lowland (pe35-42) range site. It is in the nonirrigated land capability classification 2w.

Od Olpe-Dennis Silt Loams, 3 To 7 Percent Slopes

Olpe soil makes up 50 percent of the map unit. This map unit is in the Cherokee Prairies Major Land Resource Area. This soil occurs on a moderately sloping backslope paleoterrace on upland. The runoff class is high. The parent material consists of ancient clayey alluvium. This soil is well drained. The slowest permeability is slow. It has a low available water capacity and a high shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. This soil is in the Loamy Upland (pe35-42) range site. It is in the nonirrigated land capability classification 4e.

Dennis soil makes up 35 percent of the map unit. This map unit is in the Cherokee Prairies Major Land Resource Area. This soil occurs on a moderately sloping backslope hillslope on upland. The runoff class is very high. The parent material consists of silty and clayey residuum weathered from shale, unspecified. This soil is moderately well drained. The slowest permeability is slow. It has a high available water capacity and a very high shrink swell potential. This soil is not flooded and is not ponded. The top of the seasonal high water table is at 15 inches. This soil is in the Loamy Upland (pe35-42) range site. It is in the nonirrigated land capability classification 4e.

Or Orthents, Clayey

Orthents soil makes up 100 percent of the map unit. This map unit is in the Cherokee Prairies Major Land Resource Area. This soil occurs on a gently sloping backslope hillslope on upland. The runoff class is high. The parent material consists of mine spoil or earthy fill. This soil is well drained. The slowest permeability is very slow. It has a low available water capacity and a high shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. It is in the nonirrigated land capability classification 4e.

Os Osage Silty Clay, Occasionally Flooded

Osage soil makes up 93 percent of the map unit. This map unit is in the Cherokee Prairies Major Land Resource Area. This soil occurs on a nearly level flood plain on river valley. The runoff class is high. The parent material consists of clayey alluvium. This soil is poorly drained. The slowest permeability is very slow. It has a moderate available water capacity and a very high shrink swell potential. This soil is occasionally flooded and is occasional ponded. The top of the seasonal high water table is at 6 inches. This soil is in the Clay Lowland (pe35-42) range site. It is in the nonirrigated land capability classification 3w.

Pe Parsons Silt Loam, 0 To 2 Percent Slopes

Parsons soil makes up 91 percent of the map unit. This map unit is in the Cherokee Prairies Major Land Resource Area. This soil occurs on a nearly level to gently sloping summit paleoterrace on upland. The runoff class is high. The parent material consists of loess over ancient clayey alluvium and/or residuum weathered from shale. This soil is somewhat poorly drained. The slowest permeability is slow. It has a high available water capacity and a high shrink swell potential. This soil is not flooded and is not ponded. The top of the seasonal high water table is at 12 inches. This soil is in the Clay Upland (pe35-42) range site. It is in the nonirrigated land capability classification 2s.

Sd Shidler-Catoosa Silt Loams, 1 To 8 Percent Slopes

Shidler soil makes up 50 percent of the map unit. This map unit is in the Cherokee Prairies Major Land Resource Area. This soil occurs on a gently sloping to strongly sloping shoulder hillslope on upland. The runoff class is medium. The parent material consists of residuum weathered from limestone. The soil is 4 to 20 inches deep to bedrock (lithic). This soil is well drained. The slowest permeability is moderate. It has a very low available water capacity and a low shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. This soil is in the Shallow Limy (pe35-42) range site. It is in the nonirrigated land capability classification 6e.

NONTECHNICAL SOIL DESCRIPTIONS--Continued
Labette County, Kansas

Catoosa soil makes up 35 percent of the map unit. This map unit is in the Cherokee Prairies Major Land Resource Area. This soil occurs on a gently sloping to strongly sloping summit ridge on upland. The runoff class is medium. The parent material consists of residuum weathered from limestone. The soil is 20 to 40 inches deep to bedrock (lithic). This soil is well drained. The slowest permeability is moderately slow. It has a low available water capacity and a high shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. This soil is in the Loamy Upland (pe35-42) range site. It is in the nonirrigated land capability classification 3e.

Vc Verdigris Silt Loam, Frequently Flooded

Verdigris soil makes up 85 percent of the map unit. This map unit is in the Cherokee Prairies Major Land Resource Area. This soil occurs on a nearly level to gently sloping flood plain on river valley. The runoff class is low. The parent material consists of silty alluvium. This soil is moderately well drained. The slowest permeability is moderate. It has a very high available water capacity and a low shrink swell potential. This soil is frequently flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. This soil is in the Loamy Lowland (pe35-42) range site. It is in the nonirrigated land capability classification 5w.

Vf Verdigris Silt Loam, Occasionally Flooded

Verdigris soil makes up 95 percent of the map unit. This map unit is in the Cherokee Prairies Major Land Resource Area. This soil occurs on a nearly level to gently sloping flood plain on river valley. The runoff class is low. The parent material consists of silty alluvium. This soil is moderately well drained. The slowest permeability is moderate. It has a very high available water capacity and a low shrink swell potential. This soil is occasionally flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. This soil is in the Loamy Lowland (pe35-42) range site. It is in the nonirrigated land capability classification 2w.

Zb Zaar Silty Clay, 0 To 2 Percent Slopes

Zaar soil makes up 85 percent of the map unit. This map unit is in the Cherokee Prairies Major Land Resource Area. This soil occurs on a nearly level to gently sloping footslope hillslope on upland. The runoff class is medium. The parent material consists of ancient alluvium and/or clayey colluvium and/or residuum weathered from shale. This soil is somewhat poorly drained. The slowest permeability is very slow. It has a moderate available water capacity and a very high shrink swell potential. This soil is not flooded and is not ponded. The top of the seasonal high water table is at 17 inches. This soil is in the Clay Upland (pe35-42) range site. It is in the nonirrigated land capability classification 3w.

021ES—Eram-Shidler silty clay loams, 4 to 12 percent slopes

Map Unit Composition

Eram: 50 percent
Shidler: 40 percent
Minor components: 10 percent

Component Descriptions

Eram
MLRA: 112 - Cherokee Prairies
Landform: Ridge on upland
Hillslope position: Backslope
Parent material: Silty and clayey residuum weathered from shale, unspecified
Slope: 6 to 12 percent
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic)
Drainage class: Moderately well drained
Slowest permeability: Slow (About 0.06 in/hr)
Available water capacity: Low (About 4.0 inches)
Shrink-swell potential: Low (About 2.9 LEP)
Flooding hazard: None
Depth to seasonal water saturation: About 6 to 18 inches
Runoff class: Very high
Ecological site: Clay Upland (pe35-42)
Land capability (nonirrigated): 6e

Typical Profile:
H1—0 to 8 inches; silty clay loam
H2—8 to 26 inches; silty clay
Cr—26 to 30 inches; weathered bedrock

Shidler
MLRA: 112 - Cherokee Prairies
Landform: Hillslope on upland
Hillslope position: Backslope
Parent material: Residuum weathered from limestone
Slope: 4 to 8 percent
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Slowest permeability: Moderately slow (About 0.20 in/hr)
Available water capacity: Very low (About 2.4 inches)
Shrink-swell potential: Moderate (About 5.3 LEP)
Flooding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: High
Ecological site: Shallow Limy (pe35-42)
Land capability (nonirrigated): 7s

Typical Profile:
H1—0 to 12 inches; silty clay loam
R—12 to 16 inches; unweathered bedrock

Minor Components
Zaar
Composition: About 5 percent
Geomorphic Position: hillslope on upland
Slope: 0 to 2 percent
Drainage class: Somewhat poorly drained
Ecological site: Clay Upland (pe35-42)

Dennis
Composition: About 5 percent
Geomorphic Position: hillslope on upland
Slope: 1 to 3 percent
Drainage class: Moderately well drained
Ecological site: Loamy Upland (pe35-42)

125BF—Bates-Collinsville complex, 1 to 4 percent slopes

Map Unit Composition

Bates: 50 percent
Collinsville: 40 percent
Minor components: 10 percent

Component Descriptions

Bates
MLRA: 112 - Cherokee Prairies
Landform: Ridge on upland
Hillslope position: Summit
Parent material: Sandy and silty residuum weathered from sandstone, unspecified over sandy and
silty residuum weathered from sandstone-shale
Slope: 1 to 4 percent
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic)
Drainage class: Well drained
Slowest permeability: Moderately slow (About 0.20 in/hr)
Available water capacity: Low (About 5.4 inches)
Shrink-swell potential: Moderate (About 3.0 LEP)
Flooding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Medium
Ecological site: Loamy Upland (pe35-42)
Land capability (nonirrigated): 4e

Typical Profile:
H1—0 to 9 inches; loam
H2—9 to 15 inches; loam
H3—15 to 31 inches; clay loam
Cr—31 to 35 inches; weathered bedrock

Collinsville
MLRA: 112 - Cherokee Prairies
Landform: Ridge on upland
Hillslope position: Backslope
Parent material: Sandstone residuum
Slope: 1 to 4 percent
Depth to restrictive feature: 4 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Slowest permeability: Moderately rapid (About 2.00 in/hr)
Available water capacity: Very low (About 2.1 inches)
Shrink-swell potential: Low (About 1.6 LEP)
Flooding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Very low
Ecological site: Shallow Sandstone (pe35-42)
Land capability (nonirrigated): 6e

Typical Profile:
H1—0 to 11 inches; fine sandy loam
H2—11 to 17 inches; fine sandy loam
R—17 to 21 inches; unweathered bedrock

Minor Components
Eram
Composition: About 5 percent
Geomorphic Position: ridge on upland
Slope: 1 to 4 percent
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic)
Drainage class: Moderately well drained
Ecological site: Clay Upland (pe35-42)

Talihina
Composition: About 5 percent
Geomorphic Position: upland ridge
Slope: 6 to 20 percent
Depth to restrictive feature: 10 to 20 inches to bedrock (paralithic)
Drainage class: Well drained
Ecological site: Clay Upland (pe35-42)

Ae—Apperson silty clay loam, 1 to 3 percent slopes

Map Unit Composition

Apperson: 85 percent
Minor components: 15 percent

Component Descriptions

Apperson
MLRA: 112 - Cherokee Prairies
Landform: Ridge on upland
Hillslope position: Summit
Parent material: Residuum weathered from limestone
Slope: 1 to 3 percent
Depth to restrictive feature: 40 to 60 inches to bedrock (lithic)
Drainage class: Moderately well drained
Slowest permeability: Slow (About 0.06 in/hr)
Available water capacity: Moderate (About 8.1 inches)
Shrink-swell potential: Very high (About 10.4 LEP)
Flooding hazard: None
Depth to seasonal water saturation: About 12 to 18 inches
Runoff class: Medium
Ecological site: Loamy Upland (pe35-42)
Land capability (nonirrigated): 2e

Typical Profile:
H1—0 to 7 inches; silty clay loam
H2—7 to 13 inches; silty clay loam
H3—13 to 24 inches; silty clay
H4—24 to 49 inches; silty clay
R—49 to 53 inches; unweathered bedrock

Minor Components
Catoosa
Composition: About 10 percent
Geomorphic Position: ridge on upland
Slope: 1 to 2 percent
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Ecological site: Loamy Upland (pe35-42)

Shidler
Composition: About 5 percent
Geomorphic Position: hillslope on upland
Slope: 1 to 8 percent
Depth to restrictive feature: 4 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Ecological site: Shallow Limy (pe35-42)

AED—Arents, Earthen Dam

Be—Bates loam, 1 to 3 percent slopes

Map Unit Composition

Bates: 85 percent
Minor components: 15 percent

Component Descriptions

Bates
MLRA: 112 - Cherokee Prairies
Landform: Hillslope on upland
Hillslope position: Summit
Parent material: Sandy and silty residuum weathered from sandstone, unspecified over sandy and
silty residuum weathered from sandstone-shale
Slope: 1 to 3 percent
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic)
Drainage class: Well drained
Slowest permeability: Moderately slow (About 0.20 in/hr)
Available water capacity: Low (About 4.8 inches)
Shrink-swell potential: Moderate (About 3.1 LEP)
Flooding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Medium
Ecological site: Loamy Upland (pe35-42)
Land capability (nonirrigated): 2e

Typical Profile:
H1—0 to 9 inches; loam
H2—9 to 16 inches; loam
H3—16 to 30 inches; clay loam
Cr—30 to 34 inches; weathered bedrock

Minor Components
Collinsville
Composition: About 10 percent
Geomorphic Position: hillslope on upland
Slope: 4 to 15 percent
Depth to restrictive feature: 4 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Ecological site: Shallow Sandstone (pe35-42)

Dennis
Composition: About 5 percent
Geomorphic Position: hillslope on upland
Slope: 1 to 3 percent
Drainage class: Moderately well drained
Ecological site: Loamy Upland (pe35-42)

Bf—Bates loam, 3 to 7 percent slopes

Map Unit Composition

Bates: 85 percent
Minor components: 15 percent

Component Descriptions

Bates
MLRA: 112 - Cherokee Prairies
Landform: Hillslope on upland
Hillslope position: Backslope
Parent material: Sandy and silty residuum weathered from sandstone, unspecified over sandy and
silty residuum weathered from sandstone-shale
Slope: 3 to 7 percent
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic)
Drainage class: Well drained
Slowest permeability: Moderately slow (About 0.20 in/hr)
Available water capacity: Low (About 4.1 inches)
Shrink-swell potential: Moderate (About 3.1 LEP)
Flooding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Medium
Ecological site: Loamy Upland (pe35-42)
Land capability (nonirrigated): 3e

Typical Profile:
H1—0 to 7 inches; loam
H2—7 to 12 inches; loam
H3—12 to 26 inches; clay loam
Cr—26 to 30 inches; weathered bedrock

Minor Components
Collinsville
Composition: About 10 percent
Geomorphic Position: hillslope on upland
Slope: 4 to 15 percent
Depth to restrictive feature: 4 to 20 inches to bedrock (lithic)
Drainage class: Well drained

Ecological site: Shallow Sandstone (pe35-42)

Dennis
Composition: About 5 percent
Geomorphic Position: hillslope on upland
Slope: 1 to 3 percent
Drainage class: Moderately well drained
Ecological site: Loamy Upland (pe35-42)

Bm—Bates-Collinsville complex, 4 to 15 percent slopes

Map Unit Composition

Bates: 50 percent
Collinsville: 35 percent
Minor components: 15 percent

Component Descriptions

Bates
MLRA: 112 - Cherokee Prairies
Landform: Hillslope on upland
Hillslope position: Backslope
Parent material: Sandy and silty residuum weathered from sandstone, unspecified over sandy and
silty residuum weathered from sandstone-shale
Slope: 4 to 8 percent
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic)
Drainage class: Well drained
Slowest permeability: Moderately slow (About 0.20 in/hr)
Available water capacity: Low (About 4.2 inches)
Shrink-swell potential: Moderate (About 3.1 LEP)
Flooding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Medium
Ecological site: Loamy Upland (pe35-42)
Land capability (nonirrigated): 6e

Typical Profile:
H1—0 to 8 inches; loam
H2—8 to 12 inches; loam
H3—12 to 27 inches; clay loam
Cr—27 to 31 inches; unweathered bedrock

Collinsville
MLRA: 112 - Cherokee Prairies
Landform: Hillslope on upland
Hillslope position: Shoulder
Parent material: Sandstone residuum
Slope: 4 to 15 percent
Depth to restrictive feature: 4 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Slowest permeability: Moderately rapid (About 2.00 in/hr)
Available water capacity: Very low (About 1.7 inches)
Shrink-swell potential: Low (About 1.7 LEP)
Flooding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Low
Ecological site: Shallow Sandstone (pe35-42)
Land capability (nonirrigated): 6e

Typical Profile:
H1—0 to 8 inches; fine sandy loam
H2—8 to 13 inches; fine sandy loam
R—13 to 17 inches; unweathered bedrock

Minor Components
Dennis
Composition: About 10 percent
Geomorphic Position: hillslope on upland
Slope: 1 to 3 percent
Drainage class: Moderately well drained
Ecological site: Loamy Upland (pe35-42)

Eram
Composition: About 5 percent
Geomorphic Position: hillslope on upland
Slope: 3 to 7 percent
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic)
Drainage class: Moderately well drained
Ecological site: Clay Upland (pe35-42)

Bo—Bolivar-Hector fine sandy loams, 4 to 20 percent slopes

Map Unit Composition

Bolivar: 65 percent
Hector: 25 percent
Minor components: 10 percent

Component Descriptions

Bolivar
MLRA: 112 - Cherokee Prairies
Landform: Ridge on upland
Hillslope position: Summit
Parent material: Residuum weathered from sandstone

Slope: 4 to 20 percent
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic)
Drainage class: Well drained
Slowest permeability: Moderate (About 0.60 in/hr)
Available water capacity: Low (About 3.3 inches)
Shrink-swell potential: Moderate (About 4.7 LEP)
Flooding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Medium
Ecological site: Savannah (pe35-42)
Land capability (nonirrigated): 6e

Typical Profile:
H1—0 to 5 inches; fine sandy loam
H2—5 to 12 inches; fine sandy loam
H3—12 to 27 inches; clay loam
Cr—27 to 41 inches;
R—41 to 45 inches; unweathered bedrock

Hector
MLRA: 112 - Cherokee Prairies
Landform: Ridge on upland
Hillslope position: Backslope
Parent material: Residuum weathered from sandstone
Slope: 4 to 20 percent
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Slowest permeability: Moderately rapid (About 2.00 in/hr)
Available water capacity: Very low (About 1.5 inches)
Shrink-swell potential: Low (About 1.6 LEP)
Flooding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Low
Ecological site: Shallow Savannah (pe35-42)
Land capability (nonirrigated): 7e

Typical Profile:
H1—0 to 3 inches; fine sandy loam
H2—3 to 8 inches; fine sandy loam
H3—8 to 15 inches; fine sandy loam
R—15 to 19 inches; unweathered bedrock

Minor Components
Dennis
Composition: About 10 percent
Geomorphic Position: hillslope on upland
Slope: 1 to 3 percent
Drainage class: Moderately well drained
Ecological site: Loamy Upland (pe35-42)

Br—Brazilton silty clay loam, 1 to 4 percent slopes

Map Unit Composition

Brazilton: 100 percent

Component Descriptions

Brazilton
MLRA: 112 - Cherokee Prairies
Landform: Hillslope on upland
Hillslope position: Backslope
Parent material: Mine spoil or earthy fill
Slope: 1 to 4 percent
Drainage class: Moderately well drained
Slowest permeability: Very slow (About 0.00 in/hr)
Available water capacity: Moderate (About 7.0 inches)
Shrink-swell potential: Moderate (About 5.9 LEP)
Flooding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Very high
Land capability (nonirrigated): 3e

Typical Profile:
H1—0 to 15 inches; silty clay loam
H2—15 to 42 inches; silty clay
H3—42 to 60 inches; very gravelly silty clay loam, very channery silty clay loam

Cd—Catoosa silt loam, 0 to 2 percent slopes

Map Unit Composition

Catoosa: 90 percent
Minor components: 10 percent

Component Descriptions

Catoosa
MLRA: 112 - Cherokee Prairies
Landform: Ridge on upland
Hillslope position: Summit
Parent material: Residuum weathered from limestone
Slope: 1 to 2 percent

Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Slowest permeability: Moderately slow (About 0.20 in/hr)
Available water capacity: Low (About 6.0 inches)
Shrink-swell potential: High (About 7.4 LEP)
Flooding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Medium
Ecological site: Loamy Upland (pe35-42)
Land capability (nonirrigated): 2e

Typical Profile:
H1—0 to 12 inches; silty clay loam
H2—12 to 38 inches; silty clay loam
R—38 to 42 inches; unweathered bedrock

Minor Components

Apperson
Composition: About 2 percent
Geomorphic Position: ridge on upland
Slope: 1 to 3 percent
Depth to restrictive feature: 40 to 60 inches to bedrock (lithic)
Drainage class: Moderately well drained
Ecological site: Loamy Upland (pe35-42)

Rock outcrop
Composition: About 2 percent

Kenoma
Composition: About 2 percent
Geomorphic Position: hillslope on upland
Slope: 1 to 3 percent
Drainage class: Moderately well drained
Ecological site: Clay Upland (pe35-42)

Shidler
Composition: About 2 percent
Geomorphic Position: hillslope on upland
Slope: 1 to 8 percent
Depth to restrictive feature: 4 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Ecological site: Shallow Limy (pe35-42)

Zaar
Composition: About 2 percent
Geomorphic Position: hillslope on upland
Slope: 0 to 2 percent
Drainage class: Somewhat poorly drained
Ecological site: Clay Upland (pe35-42)

Ch—Cherokee silt loam, 0 to 1 percent slopes

Map Unit Composition

Cherokee: 100 percent

Component Descriptions

Cherokee
MLRA: 112 - Cherokee Prairies
Landform: Paleoterrace on upland
Hillslope position: Summit
Parent material: Loess over ancient clayey alluvium
Slope: 0 to 1 percent
Drainage class: Somewhat poorly drained
Slowest permeability: Very slow (About 0.00 in/hr)
Available water capacity: Moderate (About 8.7 inches)
Shrink-swell potential: Very high (About 10.8 LEP)
Flooding hazard: None
Depth to seasonal water saturation: About 6 to 18 inches
Runoff class: Medium
Ecological site: Clay Upland (pe35-42)
Land capability (nonirrigated): 2s

Typical Profile:
H1—0 to 7 inches; silt loam
H2—7 to 13 inches; silt loam
H3—13 to 43 inches; clay
H4—43 to 60 inches; silty clay loam

De—Dennis silt loam, 1 to 3 percent slopes

Map Unit Composition

Dennis: 90 percent
Minor components: 10 percent

Component Descriptions

Dennis
MLRA: 112 - Cherokee Prairies
Landform: Hillslope on upland
Hillslope position: Backslope
Parent material: Silty and clayey residuum weathered from shale, unspecified
Slope: 1 to 3 percent

Drainage class: Moderately well drained
Slowest permeability: Slow (About 0.06 in/hr)
Available water capacity: High (About 9.7 inches)
Shrink-swell potential: Very high (About 9.4 LEP)
Flooding hazard: None
Depth to seasonal water saturation: About 12 to 18 inches
Runoff class: High
Ecological site: Loamy Upland (pe35-42)
Land capability (nonirrigated): 2e

Typical Profile:
H1—0 to 10 inches; silt loam
H2—10 to 15 inches; silty clay loam
H3—15 to 28 inches; silty clay
H4—28 to 60 inches; silty clay

Minor Components
Bates
Composition: About 10 percent
Geomorphic Position: hillslope on upland
Slope: 1 to 3 percent
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic)
Drainage class: Well drained
Ecological site: Loamy Upland (pe35-42)

Ef—Eram silty clay loam, 1 to 3 percent slopes

Map Unit Composition

Eram: 85 percent
Minor components: 15 percent

Component Descriptions

Eram
MLRA: 112 - Cherokee Prairies
Landform: Hillslope on upland
Hillslope position: Backslope
Parent material: Silty and clayey residuum weathered from shale, unspecified
Slope: 1 to 3 percent
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic)
Drainage class: Moderately well drained
Slowest permeability: Slow (About 0.06 in/hr)
Available water capacity: Low (About 3.4 inches)
Shrink-swell potential: High (About 7.4 LEP)
Flooding hazard: None
Depth to seasonal water saturation: About 6 to 18 inches
Runoff class: High
Ecological site: Clay Upland (pe35-42)
Land capability (nonirrigated): 3e

Typical Profile:
H1—0 to 8 inches; silty clay loam
H2—8 to 18 inches; clay
H3—18 to 26 inches; clay
Cr—26 to 30 inches; weathered bedrock

Minor Components
Bates
Composition: About 10 percent
Geomorphic Position: hillslope on upland
Slope: 1 to 3 percent
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic)
Drainage class: Well drained
Ecological site: Loamy Upland (pe35-42)

Zaar
Composition: About 5 percent
Geomorphic Position: hillslope on upland
Slope: 0 to 2 percent
Drainage class: Somewhat poorly drained
Ecological site: Clay Upland (pe35-42)

Eh—Eram silty clay loam, 3 to 7 percent slopes

Map Unit Composition

Eram: 88 percent
Minor components: 12 percent

Component Descriptions

Eram
MLRA: 112 - Cherokee Prairies
Landform: Hillslope on upland
Hillslope position: Backslope
Parent material: Silty and clayey residuum weathered from shale, unspecified
Slope: 3 to 7 percent
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic)
Drainage class: Moderately well drained
Slowest permeability: Slow (About 0.06 in/hr)
Available water capacity: Low (About 3.6 inches)
Shrink-swell potential: High (About 7.1 LEP)
Flooding hazard: None
Depth to seasonal water saturation: About 6 to 18 inches
Runoff class: Very high
Ecological site: Clay Upland (pe35-42)
Land capability (nonirrigated): 4e

Typical Profile:
H1—0 to 7 inches; silty clay loam
H2—7 to 28 inches; clay
Cr—28 to 32 inches; weathered bedrock

Minor Components
Bates
Composition: About 5 percent
Geomorphic Position: hillslope on upland
Slope: 3 to 7 percent
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic)
Drainage class: Well drained
Ecological site: Loamy Upland (pe35-42)

Lebo
Composition: About 4 percent
Geomorphic Position: hillslope on upland
Slope: 8 to 15 percent
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic)
Drainage class: Well drained
Ecological site: Loamy Upland (pe35-42)

Zaar
Composition: About 3 percent
Geomorphic Position: hillslope on upland
Slope: 0 to 2 percent
Drainage class: Somewhat poorly drained
Ecological site: Clay Upland (pe35-42)

Eo—Eram-Lebo silty clay loams, 4 to 20 percent slopes

Map Unit Composition

Eram: 60 percent
Lebo: 20 percent
Minor components: 20 percent

Component Descriptions

Eram
MLRA: 112 - Cherokee Prairies
Landform: Hillslope on upland
Hillslope position: Backslope
Parent material: Silty and clayey residuum weathered from shale, unspecified
Slope: 4 to 12 percent
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic)
Drainage class: Moderately well drained
Slowest permeability: Slow (About 0.06 in/hr)
Available water capacity: Low (About 3.7 inches)
Shrink-swell potential: High (About 7.1 LEP)
Flooding hazard: None
Depth to seasonal water saturation: About 6 to 18 inches
Runoff class: Very high
Ecological site: Clay Upland (pe35-42)
Land capability (nonirrigated): 6e

Typical Profile:
H1—0 to 8 inches; silty clay loam
H2—8 to 28 inches; silty clay
Cr—28 to 32 inches; weathered bedrock

Lebo
MLRA: 112 - Cherokee Prairies
Landform: Hillslope on upland
Hillslope position: Backslope
Parent material: Residuum weathered from shale, clayey
Slope: 8 to 15 percent
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic)
Drainage class: Well drained
Slowest permeability: Moderate (About 0.60 in/hr)
Available water capacity: Low (About 4.3 inches)
Shrink-swell potential: Moderate (About 4.7 LEP)
Flooding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Medium
Ecological site: Loamy Upland (pe35-42)
Land capability (nonirrigated): 6e

Typical Profile:
H1—0 to 9 inches; silty clay loam
H2—9 to 15 inches; silty clay loam
H3—15 to 22 inches; channery silty clay loam
H4—22 to 32 inches; extremely channery silty clay loam
Cr—32 to 36 inches; weathered bedrock

Minor Components
Zaar
Composition: About 10 percent
Geomorphic Position: hillslope on upland
Slope: 0 to 2 percent
Drainage class: Somewhat poorly drained
Ecological site: Clay Upland (pe35-42)

Collinsville
Composition: About 10 percent
Geomorphic Position: hillslope on upland
Slope: 4 to 15 percent
Depth to restrictive feature: 4 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Ecological site: Shallow Sandstone (pe35-42)

Es—Eram-Nowata complex, 2 to 7 percent slopes

Map Unit Composition

Eram: 50 percent
Nowata: 30 percent
Minor components: 20 percent

Component Descriptions

Eram
MLRA: 112 - Cherokee Prairies
Landform: Hillslope on upland
Hillslope position: Backslope
Parent material: Silty and clayey residuum weathered from shale, unspecified
Slope: 2 to 7 percent
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic)
Drainage class: Moderately well drained
Slowest permeability: Slow (About 0.06 in/hr)
Available water capacity: Low (About 3.6 inches)
Shrink-swell potential: High (About 7.1 LEP)
Flooding hazard: None
Depth to seasonal water saturation: About 6 to 18 inches
Runoff class: Very high
Ecological site: Clay Upland (pe35-42)
Land capability (nonirrigated): 4e

Typical Profile:
H1—0 to 7 inches; silty clay loam
H2—7 to 28 inches; clay
Cr—28 to 32 inches; weathered bedrock

Nowata
MLRA: 112 - Cherokee Prairies
Landform: Ridge on upland
Hillslope position: Backslope
Parent material: Residuum weathered from limestone
Slope: 2 to 7 percent
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Slowest permeability: Moderately slow (About 0.20 in/hr)
Available water capacity: Low (About 4.3 inches)
Shrink-swell potential: Moderate (About 5.2 LEP)
Flooding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: High
Ecological site: Loamy Upland (pe35-42)
Land capability (nonirrigated): 4e

Typical Profile:
H1—0 to 8 inches; silt loam
H2—8 to 13 inches; gravelly silty clay loam
H3—13 to 36 inches; very channery silty clay loam
R—36 to 40 inches; unweathered bedrock

Minor Components
Apperson
Composition: About 8 percent
Geomorphic Position: ridge on upland
Slope: 1 to 3 percent
Depth to restrictive feature: 40 to 60 inches to bedrock (lithic)
Drainage class: Moderately well drained
Ecological site: Loamy Upland (pe35-42)

Dennis
Composition: About 6 percent
Geomorphic Position: hillslope on upland
Slope: 1 to 3 percent
Drainage class: Moderately well drained
Ecological site: Loamy Upland (pe35-42)

Shidler
Composition: About 6 percent
Geomorphic Position: hillslope on upland
Slope: 1 to 8 percent
Depth to restrictive feature: 4 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Ecological site: Shallow Limy (pe35-42)

He—Hepler silt loam, occasionally flooded

Map Unit Composition

Hepler: 95 percent
Minor components: 5 percent

Component Descriptions

Hepler
MLRA: 112 - Cherokee Prairies
Landform: Flood plain on river valley
Parent material: Silty alluvium
Slope: 0 to 2 percent
Drainage class: Somewhat poorly drained
Slowest permeability: Moderately slow (About 0.20 in/hr)
Available water capacity: High (About 11.7 inches)
Shrink-swell potential: Moderate (About 3.2 LEP)

Flooding hazard: Occasional
Depth to seasonal water saturation: About 12 to 36 inches
Runoff class: Low
Ecological site: Loamy Lowland (pe35-42)
Land capability (nonirrigated): 2w

Typical Profile:
H1—0 to 9 inches; silt loam
H2—9 to 24 inches; silt loam
H3—24 to 44 inches; silty clay loam
H4—44 to 60 inches; silty clay loam

Minor Components
Osage
Composition: About 5 percent
Slope: 0 to 1 percent
Drainage class: Poorly drained
Ecological site: Clay Lowland (pe35-42)

HF—Hepler silt loam, frequently flooded

Map Unit Composition

Hepler: 95 percent
Minor components: 5 percent

Component Descriptions

Hepler
MLRA: 112 - Cherokee Prairies
Landform: Flood plain on river valley
Parent material: Silty alluvium
Slope: 0 to 3 percent
Drainage class: Somewhat poorly drained
Slowest permeability: Moderately slow (About 0.20 in/hr)
Available water capacity: Very high (About 12.4 inches)
Shrink-swell potential: Moderate (About 4.5 LEP)
Flooding hazard: Frequent
Depth to seasonal water saturation: About 12 to 36 inches
Runoff class: Low
Ecological site: Loamy Lowland (pe35-42)
Land capability (nonirrigated): 5w

Typical Profile:
H1—0 to 10 inches; silt loam
H2—10 to 30 inches; silt loam
H3—30 to 60 inches; silty clay loam

Minor Components
Osage
Composition: About 5 percent
Slope: 0 to 2 percent
Drainage class: Poorly drained
Ecological site: Clay Lowland (pe35-42)

Ka—Kanima silty clay loam, 3 to 7 percent slopes

Map Unit Composition

Kanima: 100 percent

Component Descriptions

Kanima
MLRA: 112 - Cherokee Prairies
Landform: Hillslope on upland
Hillslope position: Backslope
Parent material: Mine spoil or earthy fill
Slope: 3 to 7 percent
Drainage class: Well drained
Slowest permeability: Moderate (About 0.60 in/hr)
Available water capacity: Low (About 4.5 inches)
Shrink-swell potential: Moderate (About 3.1 LEP)
Flooding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Medium
Land capability (nonirrigated): 6s

Typical Profile:
H1—0 to 6 inches; silty clay loam
H2—6 to 60 inches; very channery silty clay loam

Kb—Kanima silty clay loam, 10 to 30 percent slopes

Map Unit Composition

Kanima: 95 percent
Minor components: 5 percent

Component Descriptions

Kanima
MLRA: 112 - Cherokee Prairies
Landform: Hillslope on upland

Hillslope position: Backslope
Parent material: Mine spoil or earthy fill
Slope: 10 to 30 percent
Drainage class: Well drained
Slowest permeability: Moderate (About 0.60 in/hr)
Available water capacity: Low (About 4.5 inches)
Shrink-swell potential: Moderate (About 3.1 LEP)
Flooding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: High
Land capability (nonirrigated): 7s

Typical Profile:
H1—0 to 6 inches; silty clay loam
H2—6 to 60 inches; very channery silty clay loam

Minor Components
Miscellaneous Water
Composition: About 5 percent

Ke—Kenoma silt loam, 1 to 3 percent slopes

Map Unit Composition

Kenoma: 85 percent
Minor components: 15 percent

Component Descriptions

Kenoma
MLRA: 112 - Cherokee Prairies
Landform: Hillslope on upland
Hillslope position: Backslope
Parent material: Loess over ancient clayey alluvium and/or residuum weathered from limestone and
shale
Slope: 1 to 3 percent
Drainage class: Moderately well drained
Slowest permeability: Very slow (About 0.00 in/hr)
Available water capacity: High (About 9.7 inches)
Shrink-swell potential: Very high (About 9.6 LEP)
Flooding hazard: None
Depth to seasonal water saturation: About 6 to 18 inches
Runoff class: High
Ecological site: Clay Upland (pe35-42)
Land capability (nonirrigated): 3e

Typical Profile:
H1—0 to 6 inches; silt loam
H2—6 to 13 inches; silt loam
H3—13 to 26 inches; silty clay
H4—26 to 49 inches; silty clay
H5—49 to 60 inches; silty clay loam

Minor Components
Catoosa
Composition: About 10 percent
Geomorphic Position: ridge on upland
Slope: 1 to 2 percent
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Ecological site: Loamy Upland (pe35-42)

Zaar
Composition: About 5 percent
Geomorphic Position: hillslope on upland
Slope: 0 to 2 percent
Drainage class: Somewhat poorly drained
Ecological site: Clay Upland (pe35-42)

Ln—Lanton silt loam, occasionally flooded

Map Unit Composition

Lanton: 95 percent
Minor components: 5 percent

Component Descriptions

Lanton
MLRA: 112 - Cherokee Prairies
Landform: Flood plain on river valley
Parent material: Silty and clayey alluvium
Slope: 0 to 2 percent
Drainage class: Somewhat poorly drained
Slowest permeability: Slow (About 0.06 in/hr)
Available water capacity: High (About 10.7 inches)
Shrink-swell potential: Moderate (About 5.4 LEP)
Flooding hazard: Occasional
Depth to seasonal water saturation: About 12 to 24 inches
Runoff class: Medium
Ecological site: Loamy Lowland (pe35-42)
Land capability (nonirrigated): 2w

Typical Profile:
H1—0 to 8 inches; silt loam

H2—8 to 37 inches; silty clay loam
H3—37 to 60 inches; silty clay loam

Minor Components
Osage
Composition: About 5 percent
Slope: 0 to 1 percent
Drainage class: Poorly drained
Ecological site: Clay Lowland (pe35-42)

M-W—Miscellaneous Water

Od—Olpe-Dennis silt loams, 3 to 7 percent slopes

Map Unit Composition

Olpe: 50 percent
Dennis: 35 percent
Minor components: 15 percent

Component Descriptions

Olpe
MLRA: 112 - Cherokee Prairies
Landform: Paleoterrace on upland
Hillslope position: Backslope
Parent material: Ancient clayey alluvium
Slope: 3 to 7 percent
Drainage class: Well drained
Slowest permeability: Slow (About 0.06 in/hr)
Available water capacity: Low (About 3.8 inches)
Shrink-swell potential: High (About 8.7 LEP)
Flooding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: High
Ecological site: Loamy Upland (pe35-42)
Land capability (nonirrigated): 4e

Typical Profile:
H1—0 to 7 inches; silt loam
H2—7 to 13 inches; gravelly silt loam
H3—13 to 30 inches; very gravelly silty clay loam
H4—30 to 44 inches; very gravelly silty clay
H5—44 to 60 inches; silty clay

Dennis
MLRA: 112 - Cherokee Prairies
Landform: Hillslope on upland
Hillslope position: Backslope
Parent material: Silty and clayey residuum weathered from shale, unspecified
Slope: 3 to 7 percent
Drainage class: Moderately well drained
Slowest permeability: Slow (About 0.06 in/hr)
Available water capacity: High (About 9.8 inches)
Shrink-swell potential: Very high (About 9.4 LEP)
Flooding hazard: None
Depth to seasonal water saturation: About 12 to 18 inches
Runoff class: Very high
Ecological site: Loamy Upland (pe35-42)
Land capability (nonirrigated): 4e

Typical Profile:
H1—0 to 10 inches; silt loam
H2—10 to 15 inches; silty clay loam
H3—15 to 30 inches; silty clay
H4—30 to 60 inches; silty clay

Minor Components
Eram
Composition: About 10 percent
Geomorphic Position: hillslope on upland
Slope: 3 to 7 percent
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic)
Drainage class: Moderately well drained
Ecological site: Clay Upland (pe35-42)

Shidler
Composition: About 5 percent
Geomorphic Position: hillslope on upland
Slope: 1 to 8 percent
Depth to restrictive feature: 4 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Ecological site: Shallow Limy (pe35-42)

Or—Orthents, Clayey

Map Unit Composition

Orthents: 100 percent

Component Descriptions

Orthents
MLRA: 112 - Cherokee Prairies
Landform: Hillslope on upland
Hillslope position: Backslope
Parent material: Mine spoil or earthy fill
Slope: 1 to 3 percent
Drainage class: Well drained
Slowest permeability: Very slow (About 0.00 in/hr)

Available water capacity: Low (About 5.6 inches)
Shrink-swell potential: High (About 7.5 LEP)
Flooding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: High
Land capability (nonirrigated): 4e

Typical Profile:
H1—0 to 17 inches; silty clay
H2—17 to 60 inches; silty clay

Os—Osage silty clay, occasionally flooded

Map Unit Composition

Osage: 93 percent
Minor components: 7 percent

Component Descriptions

Osage
MLRA: 112 - Cherokee Prairies
Landform: Flood plain on river valley
Parent material: Clayey alluvium
Slope: 0 to 1 percent
Drainage class: Poorly drained
Slowest permeability: Very slow (About 0.00 in/hr)
Available water capacity: Moderate (About 8.1 inches)
Shrink-swell potential: Very high (About 14.5 LEP)
Flooding hazard: Occasional
Ponding hazard: Occasional
Depth to seasonal water saturation: About 0 to 12 inches
Runoff class: High
Ecological site: Clay Lowland (pe35-42)
Land capability (nonirrigated): 3w

Typical Profile:
H1—0 to 12 inches; silty clay
H2—12 to 17 inches; silty clay
H3—17 to 30 inches; clay
H4—30 to 60 inches; clay

Minor Components
Hepler
Composition: About 3 percent
Slope: 0 to 2 percent
Drainage class: Somewhat poorly drained
Ecological site: Loamy Lowland (pe35-42)

Lanton
Composition: About 2 percent
Slope: 0 to 2 percent
Drainage class: Somewhat poorly drained
Ecological site: Loamy Lowland (pe35-42)

Verdigris
Composition: About 2 percent
Slope: 0 to 2 percent
Drainage class: Moderately well drained
Ecological site: Loamy Lowland (pe35-42)

Pe—Parsons silt loam, 0 to 2 percent slopes

Map Unit Composition

Parsons: 91 percent
Minor components: 9 percent

Component Descriptions

Parsons
MLRA: 112 - Cherokee Prairies
Landform: Paleoterrace on upland
Hillslope position: Summit
Parent material: Loess over ancient clayey alluvium and/or residuum weathered from shale
Slope: 0 to 2 percent
Drainage class: Somewhat poorly drained
Slowest permeability: Slow (About 0.06 in/hr)
Available water capacity: High (About 9.0 inches)
Shrink-swell potential: High (About 7.7 LEP)
Flooding hazard: None
Depth to seasonal water saturation: About 6 to 18 inches
Runoff class: High
Ecological site: Clay Upland (pe35-42)
Land capability (nonirrigated): 2s

Typical Profile:
H1—0 to 8 inches; silt loam
H2—8 to 13 inches; silt loam
H3—13 to 36 inches; silty clay
H4—36 to 60 inches; silty clay

Minor Components
Dennis
Composition: About 5 percent
Geomorphic Position: hillslope on upland
Slope: 1 to 3 percent
Drainage class: Moderately well drained
Ecological site: Loamy Upland (pe35-42)

Zaar
Composition: About 4 percent
Geomorphic Position: hillslope on upland
Slope: 0 to 2 percent
Drainage class: Somewhat poorly drained
Ecological site: Clay Upland (pe35-42)

Pt—Pits, Quarries

General Considerations: Pits are open excavations from which soil and commonly underlying material have been removed, exposing either rock or other material. Kinds include Pits, mine; Pits, gravel; and Pits, quarry. Commonly, pits are closely associated with Dumps.

Sd—Shidler-Catoosa silt loams, 1 to 8 percent slopes

Map Unit Composition

Shidler: 50 percent
Catoosa: 35 percent
Minor components: 15 percent

Component Descriptions

Shidler
MLRA: 112 - Cherokee Prairies
Landform: Hillslope on upland
Hillslope position: Shoulder
Parent material: Residuum weathered from limestone
Slope: 1 to 8 percent
Depth to restrictive feature: 4 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Slowest permeability: Moderate (About 0.60 in/hr)
Available water capacity: Very low (About 2.4 inches)
Shrink-swell potential: Low (About 1.5 LEP)
Flooding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Medium
Ecological site: Shallow Limy (pe35-42)
Land capability (nonirrigated): 6e

Typical Profile:
H1—0 to 12 inches; silt loam
R—12 to 16 inches; unweathered bedrock

Catoosa
MLRA: 112 - Cherokee Prairies
Landform: Ridge on upland
Hillslope position: Summit
Parent material: Residuum weathered from limestone
Slope: 1 to 8 percent
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Slowest permeability: Moderately slow (About 0.20 in/hr)
Available water capacity: Low (About 6.0 inches)
Shrink-swell potential: High (About 7.4 LEP)
Flooding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Medium
Ecological site: Loamy Upland (pe35-42)
Land capability (nonirrigated): 3e

Typical Profile:
H1—0 to 12 inches; silty clay loam
H2—12 to 38 inches; clay
R—38 to 42 inches; unweathered bedrock

Minor Components
Eram
Composition: About 15 percent
Geomorphic Position: hillslope on upland
Slope: 3 to 7 percent
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic)
Drainage class: Moderately well drained
Ecological site: Clay Upland (pe35-42)

Vc—Verdigris silt loam, frequently flooded

Map Unit Composition

Verdigris: 85 percent
Minor components: 15 percent

Component Descriptions

Verdigris
MLRA: 112 - Cherokee Prairies
Landform: Flood plain on river valley
Parent material: Silty alluvium
Slope: 0 to 2 percent
Drainage class: Moderately well drained
Slowest permeability: Moderate (About 0.60 in/hr)
Available water capacity: High (About 12.0 inches)

Shrink-swell potential: Low (About 2.2 LEP)
Flooding hazard: Frequent
Depth to seasonal water saturation: More than 6 feet
Runoff class: Low
Ecological site: Loamy Lowland (pe35-42)
Land capability (nonirrigated): 5w

Typical Profile:
H1—0 to 11 inches; silt loam
H2—11 to 34 inches; silt loam
H3—34 to 43 inches; silt loam
H4—43 to 60 inches; silty clay loam

Minor Components
Zaar
Composition: About 10 percent
Geomorphic Position: hillslope on upland
Slope: 0 to 2 percent
Drainage class: Somewhat poorly drained
Ecological site: Clay Upland (pe35-42)

Eram
Composition: About 5 percent
Geomorphic Position: hillslope on upland
Slope: 3 to 7 percent
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic)
Drainage class: Moderately well drained
Ecological site: Clay Upland (pe35-42)

Vf—Verdigris silt loam, occasionally flooded

Map Unit Composition

Verdigris: 95 percent
Minor components: 5 percent

Component Descriptions

Verdigris
MLRA: 112 - Cherokee Prairies
Landform: Flood plain on river valley
Parent material: Silty alluvium
Slope: 0 to 2 percent
Drainage class: Moderately well drained
Slowest permeability: Moderate (About 0.60 in/hr)
Available water capacity: Very high (About 12.5 inches)
Shrink-swell potential: Low (About 2.2 LEP)
Flooding hazard: Occasional
Depth to seasonal water saturation: More than 6 feet
Runoff class: Low
Ecological site: Loamy Lowland (pe35-42)
Land capability (nonirrigated): 2w

Typical Profile:
H1—0 to 34 inches; silt loam
H2—34 to 60 inches; silt loam

Minor Components
Osage
Composition: About 5 percent
Slope: 0 to 1 percent
Drainage class: Poorly drained
Ecological site: Clay Lowland (pe35-42)

W—Water

Zb—Zaar silty clay, 0 to 2 percent slopes

Map Unit Composition

Zaar: 85 percent
Minor components: 15 percent

Component Descriptions

Zaar
MLRA: 112 - Cherokee Prairies
Landform: Hillslope on upland
Hillslope position: Footslope
Parent material: Ancient alluvium and/or clayey colluvium and/or residuum weathered from shale
Slope: 0 to 2 percent
Drainage class: Somewhat poorly drained
Slowest permeability: Very slow (About 0.00 in/hr)
Available water capacity: Moderate (About 8.7 inches)
Shrink-swell potential: Very high (About 11.2 LEP)
Flooding hazard: None
Depth to seasonal water saturation: About 12 to 24 inches
Runoff class: Medium
Ecological site: Clay Upland (pe35-42)
Land capability (nonirrigated): 3w

Typical Profile:
H1—0 to 7 inches; silty clay
H2—7 to 17 inches; silty clay
H3—17 to 54 inches; silty clay
H4—54 to 60 inches; silty clay

Minor Components
Parsons

Composition: About 10 percent
Geomorphic Position: paleoterrace on upland
Slope: 0 to 2 percent
Drainage class: Somewhat poorly drained
Ecological site: Clay Upland (pe35-42)

Verdigris
Composition: About 5 percent
Slope: 0 to 2 percent
Drainage class: Moderately well drained
Ecological site: Loamy Lowland (pe35-42)

PRIME FARMLAND
Labette County, Kansas

Prime farmland is one of several kinds of important farmland defined by the U.S. Department of Agriculture. It is of major importance in meeting the Nation’s short− and long−range needs for food and fiber. Because the supply of high−quality farmland is limited, the U.S. Department of Agriculture recognizes that responsible levels of government, as well as individuals, should encourage and facilitate the wise use of our Nation’s prime farmland.

Prime farmland, as defined by the U.S. Department of Agriculture, is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is available for these uses. It could be cultivated land, pastureland, forestland, or other land, but it is not urban or built−up land or water areas. The soil qualities, growing season, and moisture supply are those needed for the soil to economically produce sustained high yields of crops when proper management, including water management, and acceptable farming methods are applied. In general, prime farmland has an adequate and dependable supply of moisture from precipitation or irrigation, a favorable temperature and growing season, acceptable acidity or alkalinity, an acceptable salt and sodium content, and few or no rocks. It is permeable to water and air. It is not excessively erodible or saturated with water for long periods, and it either is not frequently flooded during the growing season or is protected from flooding. Slope ranges mainly from 0 to 6 percent. More detailed information about the criteria for prime farmland is available at the local office of the Natural Resources Conservation Service.

A recent trend in land use in some parts of the survey area has been the loss of some prime farmland to industrial and urban uses. The loss of prime farmland to other uses puts pressure on marginal lands, which generally are more erodible, droughty, and less productive and cannot be easily cultivated.

The map units in the survey area that are considered prime farmland are listed in the following table. This list does not constitute a recommendation for a particular land use. On some soils included in the list, measures that overcome a hazard or limitation, such as flooding, wetness, and droughtiness, are needed. Onsite evaluation is needed to determine whether or not the hazard or limitation has been overcome by corrective measures. The extent of each listed map unit is shown in the "Acres and Proportionate Extent of Soils" table. The location is shown on the detailed soil maps. The soil qualities that affect use and management are described in other tables in this document."

PRIME FARMLAND--Continued
Labette County, Kansas : Published

Map symbol	Mapunit name	Farmland Classification
Ae	Apperson silty clay loam, 1 to 3 percent slopes	All areas are prime farmland
Be	Bates loam, 1 to 3 percent slopes	All areas are prime farmland
Bf	Bates loam, 3 to 7 percent slopes	All areas are prime farmland
Br	Brazilton silty clay loam, 1 to 4 percent slopes	All areas are prime farmland
Cd	Catoosa silt loam, 0 to 2 percent slopes	All areas are prime farmland
Ch	Cherokee silt loam, 0 to 1 percent slopes	All areas are prime farmland
De	Dennis silt loam, 1 to 3 percent slopes	All areas are prime farmland
Ef	Eram silty clay loam, 1 to 3 percent slopes	All areas are prime farmland
Ke	Kenoma silt loam, 1 to 3 percent slopes	All areas are prime farmland
Pe	Parsons silt loam, 0 to 2 percent slopes	All areas are prime farmland
Vf	Verdigris silt loam, occasionally flooded	All areas are prime farmland
Zb	Zaar silty clay, 0 to 2 percent slopes	All areas are prime farmland
He	Hepler silt loam, occasionally flooded	Prime farmland if drained
Ln	Lanton silt loam, occasionally flooded	Prime farmland if drained
Os	Osage silty clay, occasionally flooded	Prime farmland if drained

SOIL RATING FOR PLANT GROWTH, modified 1998
Labette County, Kansas

The "Soil Rating for Plant Growth, modified 1998" (SRPG) is a relative rating of the capacity of a soil to produce a specific plant under a defined management system. The index is determined from yield data on a few benchmark soils and is used to calculate yields, the net returns from crops, land assessment values, and taxes and to perform risk analysis when land management decisions are made. Specific information on plants and yields can be obtained from the local office of the Natural Resources Conservation Service or the Cooperative Extension Service.

Map symbol	Soil name	Crop Index
021ES	Eram-Shidler Silty Clay Loams, 4 To 12 Percent Slopes	27
125BF	Bates-Collinsville Complex, 1 To 4 Percent Slopes	31
AED	Arents, Earthen Dam	0
Ae	Apperson Silty Clay Loam, 1 To 3 Percent Slopes	76
Be	Bates Loam, 1 To 3 Percent Slopes	41
Bf	Bates Loam, 3 To 7 Percent Slopes	32
Bm	Bates-Collinsville Complex, 4 To 15 Percent Slopes	29
Bo	Bolivar-Hector Fine Sandy Loams, 4 To 20 Percent Slopes	26
Br	Brazilton Silty Clay Loam, 1 To 4 Percent Slopes	62
Cd	Catoosa Silt Loam, 0 To 2 Percent Slopes	67
Ch	Cherokee Silt Loam, 0 To 1 Percent Slopes	66
De	Dennis Silt Loam, 1 To 3 Percent Slopes	72
Ef	Eram Silty Clay Loam, 1 To 3 Percent Slopes	36
Eh	Eram Silty Clay Loam, 3 To 7 Percent Slopes	37
Eo	Eram-Lebo Silty Clay Loams, 4 To 20 Percent Slopes	36
Es	Eram-Nowata Complex, 2 To 7 Percent Slopes	45
HF	Hepler Silt Loam, Frequently Flooded	54
He	Hepler Silt Loam, Occasionally Flooded	72
Ka	Kanima Silty Clay Loam, 3 To 7 Percent Slopes	46
Kb	Kanima Silty Clay Loam, 10 To 30 Percent Slopes	26
Ke	Kenoma Silt Loam, 1 To 3 Percent Slopes	74
Ln	Lanton Silt Loam, Occasionally Flooded	82
M-W	Miscellaneous Water	0
Od	Olpe-Dennis Silt Loams, 3 To 7 Percent Slopes	48
Or	Orthents, Clayey	40
Os	Osage Silty Clay, Occasionally Flooded	60
Pe	Parsons Silt Loam, 0 To 2 Percent Slopes	71
Pt	Pits, Quarries	0
Sd	Shidler-Catoosa Silt Loams, 1 To 8 Percent Slopes	32
Vc	Verdigris Silt Loam, Frequently Flooded	67
Vf	Verdigris Silt Loam, Occasionally Flooded	86
W	Water	0
Zb	Zaar Silty Clay, 0 To 2 Percent Slopes	72

Labette County, Kansas: Published
Field Office Thunderbook: Soils Properties for Conservation Planning

(Entries under "Erosion factors--T" apply to the entire profile. Entries under "K", "Kf", "Wind Erodibility Group" and "Wind Erodibility Index" apply only to the surface layer)

Map symbol and soil name	Percent	Irr Cap Class	Nonirr Cap Class	Prime Farmland	Hydro-logic Group	Range site name	Windbreak suitability group	Erosion factors			Wind erodi-bility group	Wind erodi-bility index
								K	Kf	T		
021ES:ERAM------	50	N/A	6e	Not prime farmland	C	Clay Upland (pe35-42)	8	.37	.37	3	7	38
021ES:SHIDLER---	40	N/A	7s	Not prime farmland	D	Shallow Limy (pe35-42)	5	.32	.32	1	4L	86
125BF:BATES-----	50	N/A	4e	Not prime farmland	B	Loamy Upland (pe35-42)	6	.32	.32	3	5	56
125BF:COLLINSVIL LE----------	40	N/A	6e	Not prime farmland	D	Shallow Sandstone (pe35-42)	3	.20	.20	1	3	86
AED:ARENTS, EARTHEN DAM----	100	N/A	8	Not prime farmland		Unspecified		---	---	–	---	---
Ae:APPERSON-----	85	N/A	2e	All areas are prime farmland	C	Loamy Upland (pe35-42)	8	.37	.37	3	7	38
Be:BATES--------	85	N/A	2e	All areas are prime farmland	B	Loamy Upland (pe35-42)	6	.32	.32	3	5	48
Bf:BATES--------	85	N/A	3e	All areas are prime farmland	B	Loamy Upland (pe35-42)	6	.32	.32	3	5	48
Bm:BATES--------	50	N/A	6e	Not prime farmland	B	Loamy Upland (pe35-42)	6	.32	.32	3	5	48
Bm:COLLINSVILLE-	35	N/A	6e	Not prime farmland	D	Shallow Sandstone (pe35-42)	3	.20	.20	1	3	86
Bo:BOLIVAR------	65	N/A	6e	Not prime farmland	B	Savannah (pe35-42)	3	.24	.24	3	3	86
Bo:HECTOR-------	25	N/A	7e	Not prime farmland	D	Shallow Savannah (pe35-42)	3	.24	.24	1	3	86
Br:BRAZILTON----	100	N/A	3e	All areas are prime farmland	D	Unspecified	8	.37	.37	5	7	38
Cd:CATOOSA------	90	N/A	2e	All areas are prime farmland	B	Loamy Upland (pe35-42)	7	.37	.37	2	6	48
Ch:CHEROKEE-----	100	N/A	2s	All areas are prime farmland	D	Clay Upland (pe35-42)	6	.49	.49	3	5	48
De:DENNIS-------	90	N/A	2e	All areas are prime farmland	C	Loamy Upland (pe35-42)	7	.43	.43	5	6	48
Ef:ERAM---------	85	N/A	3e	All areas are prime farmland	C	Clay Upland (pe35-42)	8	.37	.37	3	7	38
Eh:ERAM---------	88	N/A	4e	Not prime farmland	C	Clay Upland (pe35-42)	8	.37	.37	3	7	38

Labette County, Kansas: Published
Field Office Thunderbook: Soils Properties for Conservation Planning--Continued

Map symbol and soil name	Percent	Irr Cap Class	Nonirr Cap Class	Prime Farmland	Hydro-logic Group	Range site name	Windbreak suitability group	Erosion factors			Wind erodi-bility group	Wind erodi-bility index
								K	Kf	T		
Eo:ERAM---------	60	N/A	6e	Not prime farmland	C	Clay Upland (pe35-42)	8	.37	.37	3	7	38
Eo:LEBO---------	20	N/A	6e	Not prime farmland	B	Loamy Upland (pe35-42)	8	.32	.32	3	7	38
Es:ERAM---------	50	N/A	4e	Not prime farmland	C	Clay Upland (pe35-42)	8	.37	.37	3	7	38
Es:NOWATA-------	30	N/A	4e	Not prime farmland	B	Loamy Upland (pe35-42)	7	.37	.37	2	6	48
HF:HEPLER-------	95	N/A	5w	Not prime farmland	C	Loamy Lowland (pe35-42)	7	.37	.37	5	6	48
He:HEPLER-------	95	N/A	2w	Prime farmland if drained	C	Loamy Lowland (pe35-42)	7	.37	.37	5	6	48
Ka:KANIMA-------	100	N/A	6s	Not prime farmland	C	Unspecified	8	.28	.32	5	7	38
Kb:KANIMA-------	95	N/A	7s	Not prime farmland	C	Unspecified	8	.28	.32	5	7	38
Ke:KENOMA-------	85	N/A	3e	All areas are prime farmland	D	Clay Upland (pe35-42)	7	.43	.43	3	6	48
Ln:LANTON-------	95	N/A	2w	Prime farmland if drained	C	Loamy Lowland (pe35-42)	7	.37	.37	5	6	86
M-W:MISCELLANEOUS WATER----------	100	N/A	N/A	Not prime farmland		Unspecified		---	---	-	---	---
Od:OLPE---------	50	N/A	4e	Not prime farmland	C	Loamy Upland (pe35-42)	7	.43	.43	5	6	48
Od:DENNIS-------	35	N/A	4e	Not prime farmland	C	Loamy Upland (pe35-42)	7	.43	.43	5	6	48
Or:ORTHENTS-----	100	N/A	4e	Not prime farmland	D	Unspecified	4	.32	.32	5	4	86
Os:OSAGE--------	93	N/A	3w	Prime farmland if drained	D	Clay Lowland (pe35-42)	4	.28	.28	5	4	86
Pe:PARSONS------	91	N/A	2s	All areas are prime farmland	D	Clay Upland (pe35-42)	6	.49	.49	3	5	48
Pt:Pits, quarries-------	100	N/A	N/A	Not prime farmland		Unspecified		---	---	-	---	0
Sd:SHIDLER------	50	N/A	6e	Not prime farmland	D	Shallow Limy (pe35-42)	5	.32	.37	1	4L	48
Sd:Catoosa------	35	N/A	3e	Not prime farmland	B	Loamy Upland (pe35-42)	7	.37	.37	2	6	48

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Map symbol and soil name	Percent	Irr Cap Class	Nonirr Cap Class	Prime Farmland	Hydro-logic Group	Range site name	Windbreak suitability group	Erosion factors			Wind erodi-bility group	Wind erodi-bility index
								K	Kf	T		
Vc:VERDIGRIS----	85	N/A	5w	Not prime farmland	B	Loamy Lowland (pe35-42)	7	.32	.32	5	6	48
Vf:VERDIGRIS----	95	N/A	2w	All areas are prime farmland	B	Loamy Lowland (pe35-42)	7	.32	.32	5	6	48
W:WATER---------	100	N/A	N/A			Unspecified		---	---	–	---	---
Zb:ZAAR---------	85	N/A	3w	All areas are prime farmland	D	Clay Upland (pe35-42)	4	.28	.28	5	4	86

RANGELAND PRODUCTIVITY
Labette County, Kansas

Use and Explanation of Rangeland, Grazed Forest Land, Native Pastureland Interpretations

Information in this subsection can be used to plan the use and management of soils for rangeland, grazed forest land, and native pasture. Different kinds of soils vary in their capacity to produce native grasses and other plants suitable for grazing. Information in this subsection provides groupings of similar soils and estimates of potential forage production, which can be used to determine livestock stocking rates.

Rangeland. Range is land on which the native vegetation (climax or natural potential plant community) is predominantly grasses, grasslike plants, forbs, and shrubs suitable for grazing and browsing. Range includes natural grasslands, savannas, many wetlands, some deserts, tundra, and certain shrub and forb communities. Rangeland receives no regular or frequent cultural treatment. The composition and production of the plant community are determined by soil, climate, topography, overstory canopy, and grazing management.

Grazed Forest Land. Includes land on which the understory includes, as an integral part of the forest plant community, plants that can be grazed without significantly impairing other forest values.

Native Pasture. Includes land on which the native vegetation (climax or natural potential plant community) is forest but which is used and managed primarily for production of native plants for forage. Native pasture includes cut–over forest land and forest land cleared and now managed for native or naturalized forage plants.

Rangeland

In areas that have similar climate and topography, differences in the kind and amount of vegetation produced on rangeland are closely related to the kind of soil. Effective management based on the relationship between the soils and vegetation and water.

The Rangeland, Grazed Forest land, Native Pastureland Interpretations shows, for each soil that supports rangeland vegetation, the ecological site and the potential annual production of vegetation in favorable, normal, unfavorable years. An explanation of the column headings in this table follows.

An ecological site is the product of all the environmental factors responsible for its development. It has characteristic soils that have developed over time throughout the soil development process; a characteristic hydrology, particularly infiltration and runoff, that has developed over time; and a characteristic plant community (kind and amount of vegetation). The hydrology of a site is influenced by development of the soil and plant community. The vegetation, soils, and hydrology are all interrelated. Each is influenced by the others and influences the development of the others. The plant community on an ecological site is typified by an association of species that differs from that of other ecological sites in the kind and/or proportion of species or in total production. Descriptions of ecological sites are provided in the Field Office Technical Guide, which is available in local offices of the Natural Resources Conservation Service.

Total dry–weight production is the amount of vegetation that can be expected to grow annually on well managed rangeland that is supporting the potential natural plant community. It includes all vegetation, whether or not it is palatable to grazing animals. It includes the current year’s growth of leaves, twigs, and fruits of woody plants. It does not include the increase in stem diameter of trees and shrubs. It is expressed in pounds per acre of air–dry vegetation for favorable, average, and unfavorable years. In a favorable year, the amount and distribution of precipitation and the temperatures make growing conditions substantially better than average. In a normal year, growing conditions are about average. In an unfavorable year, growing conditions are well below average, generally because of low available soil moisture. Yields are adjusted to a common percent of air–dry moisture content.

Range management requires a knowledge of the kinds of soil and of the potential natural plant community. It also requires an evaluation of the present range similarity index and rangeland trend. Range similarity index is determined by comparing the present plant community with the potential natural plant community on a particular rangeland ecological site. The more closely the existing community resembles the potential community, the higher the range similarity index. Rangeland trend is defined as the direction of change in an existing plant community relative to the potential natural plant community. Further information about the range similarity index and rangeland trend is available in chapter 4 of the National Range and Pasture Handbook, which is available in local offices of the Natural Resources Conservation Service. The objective in range management is to control grazing so that the plants growing on a site are about the same in kind and amount as the potential natural plant community for that site. Such management generally results in the optimum production of vegetation, control of undesirable brush species, conservation of water, and control of erosion. Sometimes, however, an area with a range similarity index somewhat below the potential meets grazing needs, provides wildlife habitat, and protects soil and water resources.

RANGELAND PRODUCTIVITY--Continued
Labette County, Kansas

(Only the soils that support rangeland vegetation suitable for grazing are rated.) Refer to range site description to determine the percentage allowable of grasses, forbs, and shrubs for the range ecological site.

Map symbol and soil name	Ecological site	Total dry-weight production		
		Favorable year	Average year	Unfavorable year
		Lb/acre	Lb/acre	Lb/acre
021ES:				
Eram	Clay Upland (pe35-42)	6,000	4,000	2,500
Shidler	Shallow Limy (pe35-42)	3,500	2,500	1,750
125BF:				
Bates	Loamy Upland (pe35-42)	6,250	4,750	3,250
Collinsville	Shallow Sandstone (pe35-42)	4,000	3,000	2,000
Ae:				
Apperson	Loamy Upland (pe35-42)	6,000	4,300	3,200
AED:				
Arents, Earthen Dam	---	---	---	---
Be:				
Bates	Loamy Upland (pe35-42)	7,000	5,500	4,000
Bf:				
Bates	Loamy Upland (pe35-42)	7,000	5,500	4,000
Bm:				
Bates	Loamy Upland (pe35-42)	7,000	5,500	4,000
Collinsville	Shallow Sandstone (pe35-42)	3,500	2,300	1,500
Bo:				
Bolivar	Savannah (pe35-42)	5,400	3,000	2,200
Hector	Shallow Savannah (pe35-42)	3,000	2,000	1,500
Br:				
Brazilton	---	---	---	---
Cd:				
Catoosa	Loamy Upland (pe35-42)	6,500	5,000	4,000
Ch:				
Cherokee	Clay Upland (pe35-42)	6,000	4,500	2,500
De:				
Dennis	Loamy Upland (pe35-42)	7,000	5,500	4,000
Ef:				
Eram	Clay Upland (pe35-42)	6,000	4,200	3,000
Eh:				
Eram	Clay Upland (pe35-42)	6,000	4,200	3,000
Eo:				
Eram	Clay Upland (pe35-42)	6,000	4,000	2,500
Lebo	Loamy Upland (pe35-42)	6,250	4,750	3,250
Es:				
Eram	Clay Upland (pe35-42)	6,000	4,200	3,000
Nowata	Loamy Upland (pe35-42)	5,500	4,000	2,500
He:				
Hepler	Loamy Lowland (pe35-42)	10,000	8,500	6,000
HF:				
Hepler	Loamy Lowland (pe35-42)	9,000	7,000	5,500
Ka:				
Kanima	---	---	---	---
Kb:				
Kanima	---	---	---	---
Ke:				
Kenoma	Clay Upland (pe35-42)	6,000	4,500	2,500
Ln:				
Lanton	Loamy Lowland (pe35-42)	10,000	7,000	5,500
M-W:				
Miscellaneous Water	---	---	---	---
Od:				
Olpe	Loamy Upland (pe35-42)	6,000	4,500	3,000
Dennis	Loamy Upland (pe35-42)	7,000	5,500	4,000
Or:				
Orthents	---	---	---	---
Os:				
Osage	Clay Lowland (pe35-42)	9,000	8,000	6,000
Pe:				
Parsons	Clay Upland (pe35-42)	6,000	4,500	2,500
Pt:				
Pits, Quarries	---	---	---	---
Sd:				
Shidler	Shallow Limy (pe35-42)	3,000	2,000	1,500
Catoosa	Loamy Upland (pe35-42)	6,500	5,000	4,000
Vc:				
Verdigris	Loamy Lowland (pe35-42)	9,000	7,000	5,500
Vf:				
Verdigris	Loamy Lowland (pe35-42)	10,000	8,500	6,000
W:				
Water	---	---	---	---
Zb:				
Zaar	Clay Upland (pe35-42)	6,000	4,500	2,500

BUILDING SITE DEVELOPMENT
Labette County, Kansas

Building Site Development

Soil properties influence the development of building sites, including the selection of the site, the design of the structure, construction, performance after construction, and maintenance. The following tables show the degree and kind of soil limitations that affect dwellings with and without basements, small commercial buildings, local roads and streets, shallow excavations, and lawns and landscaping.

The ratings in the tables are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect building site development. Not limited indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. Slightly limited indicates that the soil has features that are favorable for the specified use. The limitations are minor and can be easily overcome. Good performance and low maintenance can be expected. Somewhat limited indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. Very limited indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the tables indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.00 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

Dwellings are single-family houses of three stories or less. For dwellings without basements, the foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of 2 feet or at the depth of maximum frost penetration, whichever is deeper. For dwellings with basements, the foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of about 7 feet. The ratings for dwellings are based on the soil properties that affect the capacity of the soil to support a load without movement and on the properties that affect excavation and construction costs. The properties that affect the load-supporting capacity include depth to a water table, ponding, flooding, subsidence, linear extensibility (shrink-swell potential), and compressibility. Compressibility is inferred from the Unified classification. The properties that affect the ease and amount of excavation include depth to a water table, ponding, flooding, slope, depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, and the amount and size of rock fragments.

Small commercial buildings are structures that are less than three stories high and do not have basements. The foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of 2 feet or at the depth of maximum frost penetration, whichever is deeper. The ratings are based on the soil properties that affect the capacity of the soil to support a load without movement and on the properties that affect excavation and construction costs. The properties that affect the load-supporting capacity include depth to a water table, ponding, flooding, subsidence, linear extensibility (shrink-swell potential), and compressibility (which is inferred from the Unified classification). The properties that affect the ease and amount of excavation include flooding, depth to a water table, ponding, slope, depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, and the amount and size of rock fragments.

Local roads and streets have an all-weather surface and carry automobile and light truck traffic all year. They have a subgrade of cut or fill soil material; a base of gravel, crushed rock, or soil material stabilized by lime or cement; and a surface of flexible material (asphalt), rigid material (concrete), or gravel with a binder. The ratings are based on the soil properties that affect the ease of excavation and grading and the traffic-supporting capacity. The properties that affect the ease of excavation and grading are depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, depth to a water table, ponding, flooding, the amount of large stones, and slope. The properties that affect the traffic-supporting capacity are soil strength (as inferred from the AASHTO group index number), subsidence, linear extensibility (shrink-swell potential), the potential for frost action, depth to a water table, and ponding.

Shallow excavations are trenches or holes dug to a maximum depth of 5 or 6 feet for graves, utility lines, open ditches, or other purposes. The ratings are based on the soil properties that influence the ease of digging and the resistance to sloughing. Depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, the amount of large stones, and dense layers influence the ease of digging, filling, and compacting. Depth to the seasonal high water table, flooding, and ponding may restrict the period when excavations can be made. Slope influences the ease of using machinery. Soil texture, depth to the water table, and linear extensibility (shrink-swell potential) influence the resistance to sloughing.

Lawns and landscaping require soils on which turf and ornamental trees and shrubs can be established and maintained. Irrigation is not considered in the ratings. The ratings are based on the soil properties that affect plant growth and trafficability after vegetation is established. The properties that affect plant growth are reaction; depth to a water table; ponding; depth to bedrock or a cemented pan; the available water capacity in the upper 40 inches; the content of salts, sodium, or calcium carbonate; and sulfidic materials. The properties that affect trafficability are flooding, depth to a water table, ponding, slope, stoniness, and the amount of sand, clay, or organic matter in the surface layer.

BUILDING SITE DEVELOPMENT--Continued
Labette County, Kansas

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
021ES:							
Eram	50	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slope	0.04	Depth to soft bedrock	0.79	Slope	1.00
				Slope	0.04		
Shidler	40	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
		Shrink-swell	0.89	Shrink-swell	0.89	Shrink-swell	0.89
						Slope	0.48
125BF:							
Bates	50	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.00	Depth to soft bedrock	0.35	Shrink-swell	0.00
Collinsville	40	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
Ae:							
Apperson	85	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Depth to saturated zone	1.00	Shrink-swell	1.00
		Depth to saturated zone	1.00	Shrink-swell	1.00	Depth to saturated zone	1.00
				Depth to hard bedrock	0.54		
AED:							
Arents, Earthen Dam	100	Not rated		Not rated		Not rated	
Be:							
Bates	85	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.00	Depth to soft bedrock	0.46	Shrink-swell	0.00
				Shrink-swell	0.00		
Bf:							
Bates	85	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.00	Depth to soft bedrock	0.79	Slope	0.12
				Shrink-swell	0.00	Shrink-swell	0.00
Bm:							
Bates	50	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.00	Depth to soft bedrock	0.71	Slope	0.48
				Shrink-swell	0.00	Shrink-swell	0.00
Collinsville	35	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
		Slope	0.16	Slope	0.16	Slope	1.00
Bo:							
Bolivar	65	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Depth to soft bedrock	0.71	Slope	1.00
		Shrink-swell	0.62	Slope	0.63	Shrink-swell	0.62
				Shrink-swell	0.62		
Hector	25	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
		Slope	0.63	Slope	0.63	Slope	1.00
Br:							
Brazilton	100	Somewhat limited		Very limited		Very limited	
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
Cd:							
Catoosa	90	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Depth to hard bedrock	1.00	Shrink-swell	1.00
		Depth to hard bedrock	0.01	Shrink-swell	1.00	Depth to hard bedrock	0.01
Ch:							
Cherokee	100	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Depth to saturated zone	1.00	Shrink-swell	1.00
		Depth to saturated zone	1.00	Shrink-swell	1.00	Depth to saturated zone	1.00

BUILDING SITE DEVELOPMENT--Continued
Labette County, Kansas

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
De:							
Dennis	90	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Depth to saturated zone	1.00	Shrink-swell	1.00
		Depth to saturated zone	1.00	Shrink-swell	1.00	Depth to saturated zone	1.00
Ef:							
Eram	85	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Depth to saturated zone	1.00	Shrink-swell	1.00
		Depth to saturated zone	1.00	Shrink-swell	1.00	Depth to saturated zone	1.00
				Depth to soft bedrock	0.79		
Eh:							
Eram	88	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Depth to saturated zone	1.00	Shrink-swell	1.00
		Depth to saturated zone	1.00	Shrink-swell	1.00	Depth to saturated zone	1.00
				Depth to soft bedrock	0.64	Slope	0.12
Eo:							
Eram	60	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Depth to saturated zone	1.00	Shrink-swell	1.00
		Depth to saturated zone	1.00	Shrink-swell	1.00	Depth to saturated zone	1.00
		Slope	0.00	Depth to soft bedrock	0.64	Slope	1.00
				Slope	0.00		
Lebo	20	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Slope	1.00
				Depth to soft bedrock	0.29		
Es:							
Eram	50	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Depth to saturated zone	1.00	Shrink-swell	1.00
		Depth to saturated zone	1.00	Shrink-swell	1.00	Depth to saturated zone	1.00
				Depth to soft bedrock	0.64	Slope	0.12
Nowata	30	Somewhat limited		Very limited		Somewhat limited	
		Depth to hard bedrock	0.06	Depth to hard bedrock	1.00	Slope	0.12
						Depth to hard bedrock	0.06
He:							
Hepler	95	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to saturated zone	0.39	Depth to saturated zone	1.00	Depth to saturated zone	0.39
		Shrink-swell	0.01	Shrink-swell	0.01	Shrink-swell	0.01
HF:							
Hepler	95	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to saturated zone	0.39	Depth to saturated zone	1.00	Depth to saturated zone	0.39
				Shrink-swell	0.50		
Ka:							
Kanima	100	Not limited		Not limited		Somewhat limited	
						Slope	0.12
Kb:							
Kanima	95	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
Ke:							
Kenoma	85	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Depth to saturated zone	1.00	Shrink-swell	1.00
		Depth to saturated zone	1.00	Shrink-swell	1.00	Depth to saturated zone	1.00
Ln:							
Lanton	95	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to saturated zone	0.98	Depth to saturated zone	1.00	Depth to saturated zone	0.98
		Shrink-swell	0.56	Shrink-swell	0.56	Shrink-swell	0.56

BUILDING SITE DEVELOPMENT--Continued
Labette County, Kansas

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
M-W:							
Miscellaneous Water-	100	Not rated		Not rated		Not rated	
Od:							
Olpe	50	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
						Slope	0.12
Dennis	35	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Depth to saturated zone	1.00	Shrink-swell	1.00
		Depth to saturated zone	1.00	Shrink-swell	1.00	Depth to saturated zone	1.00
						Slope	0.12
Or:							
Orthents	100	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
Os:							
Osage	93	Very limited		Very limited		Very limited	
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
Pe:							
Parsons	91	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Depth to saturated zone	1.00	Shrink-swell	1.00
		Depth to saturated zone	1.00	Shrink-swell	1.00	Depth to saturated zone	1.00
Pt:							
Pits, Quarries	100	Not rated		Not rated		Not rated	
Sd:							
Shidler	50	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
						Slope	0.12
Catoosa	35	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Depth to hard bedrock	1.00	Shrink-swell	1.00
		Depth to hard bedrock	0.01	Shrink-swell	1.00	Slope	0.12
						Depth to hard bedrock	0.01
Vc:							
Verdigris	85	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
Vf:							
Verdigris	95	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
W:							
Water	100	Not rated		Not rated		Not rated	
Zb:							
Zaar	85	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Depth to saturated zone	1.00	Shrink-swell	1.00
		Depth to saturated zone	1.00	Shrink-swell	1.00	Depth to saturated zone	1.00

BUILDING SITE DEVELOPMENT--Continued
Labette County, Kansas

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
021ES:							
Eram	50	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slope	0.04	Too clayey	0.82	Depth to bedrock	0.80
				Depth to soft bedrock	0.79	Slope	0.04
				Cutbanks cave	0.10	Droughty	0.00
				Slope	0.04		
Shidler	40	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to bedrock	1.00
		Shrink-swell	0.89	Cutbanks cave	0.10	Droughty	0.92
						Content of large stones	0.32
125BF:							
Bates	50	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.00	Depth to soft bedrock	0.35	Depth to bedrock	0.35
				Cutbanks cave	0.10		
Collinsville	40	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to bedrock	1.00
				Cutbanks cave	0.10	Droughty	0.98
Ae:							
Apperson	85	Very limited		Very limited		Somewhat limited	
		Shrink-swell	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.94
		Depth to saturated zone	0.94	Depth to hard bedrock	0.54		
				Too clayey	0.18		
				Cutbanks cave	0.10		
AED:							
Arents, Earthen Dam	100	Not rated		Not rated		Not rated	
Be:							
Bates	85	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.00	Depth to soft bedrock	0.46	Depth to bedrock	0.46
				Cutbanks cave	0.10		
Bf:							
Bates	85	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.00	Depth to soft bedrock	0.79	Depth to bedrock	0.80
				Cutbanks cave	0.10		
Bm:							
Bates	50	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.00	Depth to soft bedrock	0.71	Depth to bedrock	0.71
				Cutbanks cave	0.10		
Collinsville	35	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to bedrock	1.00
		Slope	0.16	Slope	0.16	Droughty	1.00
				Cutbanks cave	0.10	Slope	0.16
Bo:							
Bolivar	65	Somewhat limited		Somewhat limited		Somewhat limited	
		Slope	0.63	Depth to soft bedrock	0.71	Depth to bedrock	0.71
		Shrink-swell	0.62	Slope	0.63	Slope	0.63
				Cutbanks cave	0.10	Droughty	0.26
Hector	25	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to bedrock	1.00
		Slope	0.63	Slope	0.63	Droughty	1.00
				Cutbanks cave	0.10	Slope	0.63
Br:							
Brazilton	100	Very limited		Somewhat limited		Not limited	
		Shrink-swell	1.00	Cutbanks cave	0.10		
Cd:							
Catoosa	90	Very limited		Very limited		Somewhat limited	
		Shrink-swell	1.00	Depth to hard bedrock	1.00	Depth to bedrock	0.01
		Depth to hard bedrock	0.01	Too clayey	0.82		
				Cutbanks cave	0.10		

BUILDING SITE DEVELOPMENT--Continued
Labette County, Kansas

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Ch:							
Cherokee	100	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Too clayey	0.92		
				Depth to dense layer	0.50		
				Cutbanks cave	0.10		
De:							
Dennis	90	Very limited		Very limited		Somewhat limited	
		Shrink-swell	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.94
		Depth to saturated zone	0.94	Too clayey	0.59		
				Cutbanks cave	0.10		
Ef:							
Eram	85	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Depth to soft bedrock	0.79	Depth to bedrock	0.80
				Too clayey	0.12	Droughty	0.15
				Cutbanks cave	0.10		
Eh:							
Eram	88	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Depth to soft bedrock	0.64	Depth to bedrock	0.65
				Too clayey	0.12	Droughty	0.06
				Cutbanks cave	0.10		
Eo:							
Eram	60	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Depth to soft bedrock	0.64	Depth to bedrock	0.65
		Slope	0.00	Too clayey	0.12	Droughty	0.05
				Cutbanks cave	0.10	Slope	0.00
				Slope	0.00		
Lebo	20	Somewhat limited		Somewhat limited		Somewhat limited	
		Slope	0.63	Slope	0.63	Slope	0.63
				Depth to soft bedrock	0.29	Depth to bedrock	0.29
				Cutbanks cave	0.10		
Es:							
Eram	50	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Depth to soft bedrock	0.64	Depth to bedrock	0.65
				Too clayey	0.12	Droughty	0.06
				Cutbanks cave	0.10		
Nowata	30	Somewhat limited		Very limited		Somewhat limited	
		Depth to hard bedrock	0.06	Depth to hard bedrock	1.00	Depth to bedrock	0.06
				Cutbanks cave	0.10		
He:							
Hepler	95	Very limited		Very limited		Somewhat limited	
		Flooding	1.00	Depth to saturated zone	1.00	Flooding	0.60
		Depth to saturated zone	0.19	Flooding	0.60	Depth to saturated zone	0.19
		Shrink-swell	0.01	Cutbanks cave	0.10		
HF:							
Hepler	95	Very limited		Very limited		Very limited	
		Flooding	1.00	Depth to saturated zone	1.00	Flooding	1.00
		Depth to saturated zone	0.19	Flooding	0.80	Depth to saturated zone	0.19
				Cutbanks cave	0.10		
Ka:							
Kanima	100	Not limited		Somewhat limited		Somewhat limited	
				Depth to dense layer	0.50	Droughty	0.37
				Cutbanks cave	0.10		

BUILDING SITE DEVELOPMENT--Continued
Labette County, Kansas

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Kb:							
Kanima	95	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
				Depth to dense layer	0.50	Droughty	0.37
				Cutbanks cave	0.10		
Ke:							
Kenoma	85	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Too clayey	0.41		
				Cutbanks cave	0.10		
Ln:							
Lanton	95	Very limited		Very limited		Somewhat limited	
		Flooding	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.75
		Depth to saturated zone	0.75	Flooding	0.60	Flooding	0.60
		Shrink-swell	0.56	Cutbanks cave	0.10		
M-W:							
Miscellaneous Water-	100	Not rated		Not rated		Not rated	
Od:							
Olpe	50	Very limited		Very limited		Somewhat limited	
		Shrink-swell	1.00	Cutbanks cave	1.00	Droughty	0.79
				Too clayey	0.03		
Dennis	35	Very limited		Very limited		Somewhat limited	
		Shrink-swell	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.94
		Depth to saturated zone	0.94	Too clayey	0.59		
				Cutbanks cave	0.10		
Or:							
Orthents	100	Very limited		Somewhat limited		Somewhat limited	
		Shrink-swell	1.00	Depth to dense layer	0.50	Droughty	0.12
				Too clayey	0.28		
				Cutbanks cave	0.10		
Os:							
Osage	93	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Ponding	1.00	Ponding	1.00
		Ponding	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Too clayey	1.00	Too clayey	1.00
		Flooding	1.00	Flooding	0.60	Flooding	0.60
				Cutbanks cave	0.10		
Pe:							
Parsons	91	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Too clayey	0.59		
				Cutbanks cave	0.10		
Pt:							
Pits, Quarries	100	Not rated		Not rated		Not rated	
Sd:							
Shidler	50	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to bedrock	1.00
				Cutbanks cave	0.10	Droughty	0.92
						Content of large stones	0.05
Catoosa	35	Very limited		Very limited		Somewhat limited	
		Shrink-swell	1.00	Depth to hard bedrock	1.00	Depth to bedrock	0.01
		Depth to hard bedrock	0.01	Too clayey	0.82		
				Cutbanks cave	0.10		
Vc:							
Verdigris	85	Very limited		Somewhat limited		Very limited	
		Flooding	1.00	Flooding	0.80	Flooding	1.00
				Cutbanks cave	0.10		

BUILDING SITE DEVELOPMENT--Continued
Labette County, Kansas

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Vf:							
Verdigris	95	Very limited Flooding	1.00	Somewhat limited Flooding Cutbanks cave	0.60 0.10	Somewhat limited Flooding	0.60
W:							
Water	100	Not rated		Not rated		Not rated	
Zb:							
Zaar	85	Very limited Shrink-swell Depth to saturated zone	1.00 0.83	Very limited Depth to saturated zone Too clayey Cutbanks cave	1.00 0.41 0.10	Very limited Too clayey Depth to saturated zone	1.00 0.83

CONSTRUCTION MATERIALS
Labette County, Kansas

Construction Materials

The following tables give information about the soils as potential sources of gravel, sand, topsoil, reclamation material, and roadfill. Normal compaction, minor processing, and other standard construction practices are assumed.

The soils are rated good, fair, or poor as potential sources of topsoil, reclamation material, and roadfill. The features that limit the soils as sources of these materials are specified in the tables. The numerical ratings given after the specified features indicate the degree to which the features limit the soils as sources of topsoil, reclamation material, or roadfill. The lower the number, the greater the limitation.

The soils are rated as a probable or improbable source of sand and gravel. A rating of probable means that the source material is likely to be in or below the soil. The numerical ratings in these columns indicate the degree of probability. The number 0.00 indicates that the soil is an improbable source. A number between 0.00 and 1.00 indicates the degree to which the soil is a probable source of sand or gravel.

Sand and gravel are natural aggregates suitable for commercial use with a minimum of processing. They are used in many kinds of construction. Specifications for each use vary widely. In these tables, only the probability of finding material in suitable quantity is evaluated. The suitability of the material for specific purposes is not evaluated, nor are factors that affect excavation of the material. The properties used to evaluate the soil as a source of sand or gravel are gradation of grain sizes (as indicated by the Unified classification of the soil), the thickness of suitable material, and the content of rock fragments. If the lowest layer of the soil contains sand or gravel, the soil is rated as a probable source regardless of thickness. The assumption is that the sand or gravel layer below the depth of observation exceeds the minimum thickness.

Topsoil is used to cover an area so that vegetation can be established and maintained. The upper 40 inches of a soil is evaluated for use as topsoil. Also evaluated is the reclamation potential of the borrow area. The ratings are based on the soil properties that affect plant growth; the ease of excavating, loading, and spreading the material; and reclamation of the borrow area. Toxic substances, soil reaction, and the properties that are inferred from soil texture, such as available water capacity and fertility, affect plant growth. The ease of excavating, loading, and spreading is affected by rock fragments, slope, depth to a water table, soil texture, and thickness of suitable material. Reclamation of the borrow area is affected by slope, depth to a water table, rock fragments, depth to bedrock or a cemented pan, and toxic material.

The surface layer of most soils is generally preferred for topsoil because of its organic matter content. Organic matter greatly increases the absorption and retention of moisture and nutrients for plant growth.

Reclamation material is used in areas that have been drastically disturbed by surface mining or similar activities. When these areas are reclaimed, layers of soil material or unconsolidated geological material, or both, are replaced in a vertical sequence. The reconstructed soil favors plant growth. The ratings in the table do not apply to quarries and other mined areas that require an offsite source of reconstruction material. The ratings are based on the soil properties that affect erosion and stability of the surface and the productive potential of the reconstructed soil. These properties include the content of sodium, salts, and calcium carbonate; reaction; available water capacity; erodibility; texture; content of rock fragments; and content of organic matter and other features that affect fertility.

Roadfill is soil material that is excavated in one place and used in road embankments in another place. In this table, the soils are rated as a source of roadfill for low embankments, generally less than 6 feet high and less exacting in design than higher embankments.

The ratings are for the whole soil, from the surface to a depth of about 5 feet. It is assumed that soil layers will be mixed when the soil material is excavated and spread.

The ratings are based on the amount of suitable material and on soil properties that affect the ease of excavation and the performance of the material after it is in place. The thickness of the suitable material is a major consideration. The ease of excavation is affected by large stones, depth to a water table, and slope. How well the soil performs in place after it has been compacted and drained is determined by its strength (as inferred from the AASHTO classification of the soil) and linear extensibility (shrink–swell potential).

CONSTRUCTION MATERIALS--Continued
Labette County, Kansas

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The ratings given for the thickest layer are for the thickest layer above and excluding the bottom layer. The numbers in the value columns range from 0.00 to 0.99. The greater the value, the greater the likelihood that the bottom layer or thickest layer of the soil is a source of sand or gravel. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
021ES:					
Eram	50	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Shidler	40	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
125BF:					
Bates	50	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Collinsville	40	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Ae:					
Apperson	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
AED:					
Arents, Earthen Dam	100	Not rated		Not rated	
Be:					
Bates	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Bf:					
Bates	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Bm:					
Bates	50	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Collinsville	35	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Bo:					
Bolivar	65	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Hector	25	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Br:					
Brazilton	100	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Cd:					
Catoosa	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Ch:					
Cherokee	100	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
De:					
Dennis	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Ef:					
Eram	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00

CONSTRUCTION MATERIALS--Continued
Labette County, Kansas

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The ratings given for the thickest layer are for the thickest layer above and excluding the bottom layer. The numbers in the value columns range from 0.00 to 0.99. The greater the value, the greater the likelihood that the bottom layer or thickest layer of the soil is a source of sand or gravel. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
Eh:					
Eram	88	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Eo:					
Eram	60	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Lebo	20	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Es:					
Eram	50	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Nowata	30	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
He:					
Hepler	95	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
HF:					
Hepler	95	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Ka:					
Kanima	100	Poor		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
Kb:					
Kanima	95	Poor		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
Ke:					
Kenoma	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Ln:					
Lanton	95	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
M-W:					
Miscellaneous Water	100	Not rated		Not rated	
Od:					
Olpe	50	Poor		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
Dennis	35	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Or:					
Orthents	100	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Os:					
Osage	93	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00

CONSTRUCTION MATERIALS--Continued
Labette County, Kansas

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The ratings given for the thickest layer are for the thickest layer above and excluding the bottom layer. The numbers in the value columns range from 0.00 to 0.99. The greater the value, the greater the likelihood that the bottom layer or thickest layer of the soil is a source of sand or gravel. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
Pe:					
Parsons	91	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Pt:					
Pits, Quarries	100	Not rated		Not rated	
Sd:					
Shidler	50	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Catoosa	35	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Vc:					
Verdigris	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Vf:					
Verdigris	95	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
W:					
Water	100	Not rated		Not rated	
Zb:					
Zaar	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00

CONSTRUCTION MATERIALS--Continued
Labette County, Kansas

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.00 to 0.99. The smaller the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
021ES:							
Eram	50	Poor		Poor		Poor	
		Too clayey	0.00	Depth to bedrock	0.00	Depth to saturated zone	0.00
		Depth to bedrock	0.21	Depth to saturated zone	0.00	Too Clayey	0.00
		Droughty	0.23			Depth to bedrock	0.21
		Too acid	0.97			Slope	0.96
		No water erosion limitation	0.99				
Shidler	40	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Depth to bedrock	0.00
		Depth to bedrock	0.00	Shrink-swell	0.70	Rock fragments	0.50
		Too clayey	0.98			Too Clayey	0.98
125BF:							
Bates	50	Fair		Poor		Fair	
		Too clayey	0.32	Depth to bedrock	0.00	Too Clayey	0.23
		Too acid	0.54			Rock fragments	0.24
		Depth to bedrock	0.65			Depth to bedrock	0.65
		Low content of organic matter	0.88			Too acid	0.98
		Droughty	0.95				
Collinsville	40	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Depth to bedrock	0.00
		Depth to bedrock	0.00				
		Too acid	0.68				
Ae:							
Apperson	85	Poor		Poor		Poor	
		Too clayey	0.00	Shrink-swell	0.00	Too Clayey	0.00
		Low content of organic matter	0.50	Depth to saturated zone	0.04	Depth to saturated zone	0.04
		Too acid	0.95	Depth to bedrock	0.46		
		No water erosion limitation	0.99				
AED:							
Arents, Earthen Dam	100	Not rated		Not rated		Not rated	
Be:							
Bates	85	Fair		Poor		Fair	
		Too clayey	0.32	Depth to bedrock	0.00	Too Clayey	0.23
		Depth to bedrock	0.54			Depth to bedrock	0.54
		Too acid	0.61				
		Droughty	0.70				
		Low content of organic matter	0.88				
Bf:							
Bates	85	Fair		Poor		Fair	
		Depth to bedrock	0.21	Depth to bedrock	0.00	Depth to bedrock	0.21
		Droughty	0.28			Too Clayey	0.23
		Too clayey	0.32				
		Too acid	0.61				
		Low content of organic matter	0.88				
Bm:							
Bates	50	Fair		Poor		Fair	
		Depth to bedrock	0.29	Depth to bedrock	0.00	Too Clayey	0.23
		Too clayey	0.32			Depth to bedrock	0.29
		Droughty	0.33				
		Too acid	0.61				
		Low content of organic matter	0.88				
Collinsville	35	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Depth to bedrock	0.00
		Depth to bedrock	0.00			Slope	0.84
		Too acid	0.68				

CONSTRUCTION MATERIALS--Continued
Labette County, Kansas

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.00 to 0.99. The smaller the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Bo:							
Bolivar	65	Fair		Poor		Fair	
		Droughty	0.02	Depth to bedrock	0.00	Depth to bedrock	0.29
		Low content of organic matter	0.12	Shrink-swell	0.91	Slope	0.37
		Depth to bedrock	0.29			Too Clayey	0.53
		Too acid	0.54			Too acid	0.98
		Too clayey	0.92				
Hector	25	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Depth to bedrock	0.00
		Depth to bedrock	0.00			Slope	0.37
		Too acid	0.32			Too acid	0.88
		Low content of organic matter	0.50				
Br:							
Brazilton	100	Poor		Fair		Poor	
		Too clayey	0.00	Shrink-swell	0.84	Too Clayey	0.00
		Low content of organic matter	0.88				
		Too acid	0.97				
		No water erosion limitation	0.99				
Cd:							
Catoosa	90	Poor		Poor		Poor	
		Too clayey	0.00	Depth to bedrock	0.00	Too Clayey	0.00
		Too acid	0.95	Shrink-swell	0.19	Depth to bedrock	0.99
		Depth to bedrock	0.99				
		No water erosion limitation	0.99				
Ch:							
Cherokee	100	Poor		Poor		Poor	
		Too clayey	0.00	Depth to saturated zone	0.00	Too Clayey	0.00
		Too acid	0.54	Shrink-swell	0.12	Depth to saturated zone	0.00
		Water erosion	0.68			Too acid	0.98
		Low content of organic matter	0.92				
De:							
Dennis	90	Poor		Fair		Poor	
		Too clayey	0.00	Shrink-swell	0.03	Too Clayey	0.00
		Low content of organic matter	0.50	Depth to saturated zone	0.04	Depth to saturated zone	0.04
		Too acid	0.74				
		Water erosion	0.90				
Ef:							
Eram	85	Poor		Poor		Poor	
		Too clayey	0.00	Depth to bedrock	0.00	Too Clayey	0.00
		Droughty	0.05	Depth to saturated zone	0.00	Depth to saturated zone	0.00
		Depth to bedrock	0.21	Shrink-swell	0.17	Depth to bedrock	0.21
		Too acid	0.84				
		No water erosion limitation	0.99				
Eh:							
Eram	88	Poor		Poor		Poor	
		Too clayey	0.00	Depth to bedrock	0.00	Too Clayey	0.00
		Droughty	0.11	Depth to saturated zone	0.00	Depth to saturated zone	0.00
		Depth to bedrock	0.35	Shrink-swell	0.20	Depth to bedrock	0.35
		Too acid	0.95				
		No water erosion limitation	0.99				
Eo:							
Eram	60	Poor		Poor		Poor	
		Too clayey	0.00	Depth to bedrock	0.00	Too Clayey	0.00
		Droughty	0.12	Depth to saturated zone	0.00	Depth to saturated zone	0.00
		Depth to bedrock	0.35	Shrink-swell	0.20	Depth to bedrock	0.35
		Too acid	0.95				
		No water erosion limitation	0.99				

CONSTRUCTION MATERIALS--Continued
Labette County, Kansas

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.00 to 0.99. The smaller the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Lebo	20	Fair		Poor		Fair	
		Droughty	0.42	Depth to bedrock	0.00	Slope	0.37
		Low content of organic matter	0.50			Depth to bedrock	0.71
		Depth to bedrock	0.71				
Es:							
Eram	50	Poor		Poor		Poor	
		Too clayey	0.00	Depth to bedrock	0.00	Too Clayey	0.00
		Droughty	0.11	Depth to saturated zone	0.00	Depth to saturated zone	0.00
		Depth to bedrock	0.35	Shrink-swell	0.20	Depth to bedrock	0.35
		Too acid	0.95				
		No water erosion limitation	0.99				
Nowata	30	Fair		Poor		Poor	
		Droughty	0.41	Depth to bedrock	0.00	Rock fragments	0.00
		Low content of organic matter	0.50	No shrink-swell limitation	0.99	Too Clayey	0.64
		Depth to bedrock	0.93			Depth to bedrock	0.93
		Too acid	0.95				
		Too clayey	0.98				
		No water erosion limitation	0.99				
He:							
Hepler	95	Fair		Fair		Fair	
		Too acid	0.68	Depth to saturated zone	0.53	Depth to saturated zone	0.53
		Low content of organic matter	0.88			Too Clayey	0.66
		Too clayey	0.92				
		No water erosion limitation	0.99				
HF:							
Hepler	95	Fair		Fair		Fair	
		Low content of organic matter	0.12	Depth to saturated zone	0.53	Depth to saturated zone	0.53
		Too acid	0.20	Shrink-swell	0.99	Too acid	0.76
		No water erosion limitation	0.99				
Ka:							
Kanima	100	Fair		Good		Poor	
		Too clayey	0.50			Hard to reclaim	0.00
		Low content of organic matter	0.50			Too Clayey	0.33
		Droughty	0.57				
Kb:							
Kanima	95	Fair		Fair		Poor	
		Too clayey	0.50	Slope	0.50	Hard to reclaim	0.00
		Low content of organic matter	0.50			Slope	0.00
		Droughty	0.57			Too Clayey	0.33
Ke:							
Kenoma	85	Poor		Poor		Poor	
		Too clayey	0.00	Depth to saturated zone	0.00	Too Clayey	0.00
		Too acid	0.84	Shrink-swell	0.13	Depth to saturated zone	0.00
		Low content of organic matter	0.88				
		Water erosion	0.90				
Ln:							
Lanton	95	Fair		Fair		Fair	
		Too acid	0.95	Depth to saturated zone	0.14	Depth to saturated zone	0.14
		No water erosion limitation	0.99	Shrink-swell	0.79		
M-W:							
Miscellaneous Water-	100	Not rated		Not rated		Not rated	

CONSTRUCTION MATERIALS--Continued
Labette County, Kansas

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.00 to 0.99. The smaller the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Od:							
Olpe	50	Fair		Fair		Poor	
		Droughty	0.17	Shrink-swell	0.20	Rock fragments	0.00
		Too clayey	0.76			Too Clayey	0.63
		Too acid	0.84				
		Water erosion	0.90				
Dennis	35	Poor		Fair		Poor	
		Too clayey	0.00	Shrink-swell	0.03	Too Clayey	0.00
		Low content of organic matter	0.50	Depth to saturated zone	0.04	Depth to saturated zone	0.04
		Too acid	0.74				
		Water erosion	0.90				
Or:							
Orthents	100	Poor		Fair		Poor	
		Too clayey	0.00	Shrink-swell	0.19	Hard to reclaim	0.00
		Low content of organic matter	0.50			Too Clayey	0.00
		Droughty	0.99				
Os:							
Osage	93	Poor		Poor		Poor	
		Too clayey	0.00	Depth to saturated zone	0.00	Depth to saturated zone	0.00
		Too acid	0.84	Shrink-swell	0.00	Too Clayey	0.00
		Low content of organic matter	0.88				
Pe:							
Parsons	91	Poor		Poor		Poor	
		Too clayey	0.00	Depth to saturated zone	0.00	Too Clayey	0.00
		Low content of organic matter	0.12	Shrink-swell	0.33	Depth to saturated zone	0.00
		Too acid	0.61			Too acid	0.99
		Water erosion	0.68				
Pt:							
Pits, Quarries	100	Not rated		Not rated		Not rated	
Sd:							
Shidler	50	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Depth to bedrock	0.00
		Depth to bedrock	0.00			Rock fragments	0.92
Catoosa	35	Poor		Poor		Poor	
		Too clayey	0.00	Depth to bedrock	0.00	Too Clayey	0.00
		Too acid	0.95	Shrink-swell	0.19	Depth to bedrock	0.99
		Depth to bedrock	0.99				
		No water erosion limitation	0.99				
Vc:							
Verdigris	85	Fair		Good		Good	
		Too acid	0.99				
Vf:							
Verdigris	95	Good		Good		Good	
W:							
Water	100	Not rated		Not rated		Not rated	
Zb:							
Zaar	85	Poor		Fair		Poor	
		Too clayey	0.00	Shrink-swell	0.02	Too Clayey	0.00
		Low content of organic matter	0.88	Depth to saturated zone	0.09	Depth to saturated zone	0.09

RECREATIONAL INTERPRETATIONS
Labette County, Kansas

Recreation

The soils of the survey area are rated in the following tables according to limitations that affect their suitability for recreation. The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect the recreational uses. Not limited indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. Slightly limited indicates that the soil has features that are favorable for the specified use. The limitations are minor and can be easily overcome. Good performance and low maintenance can be expected. Somewhat limited indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. Very limited indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the tables indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.00 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

The ratings in the tables are based on restrictive soil features, such as wetness, slope, and texture of the surface layer. Susceptibility to flooding is considered. Not considered in the ratings, but important in evaluating a site, are the location and accessibility of the area, the size and shape of the area and its scenic quality, vegetation, access to water, potential water impoundment sites, and access to public sewer lines. The capacity of the soil to absorb septic tank effluent and the ability of the soil to support vegetation also are important. Soils that are subject to flooding are limited for recreational uses by the duration and intensity of flooding and the season when flooding occurs. In planning recreational facilities, onsite assessment of the height, duration, intensity, and frequency of flooding is essential.

The information in this table can be supplemented by other information in this survey, for example, interpretations for building site development, construction materials, sanitary facilities, and water management.

Camp areas require site preparation, such as shaping and leveling the tent and parking areas, stabilizing roads and intensively used areas, and installing sanitary facilities and utility lines. Camp areas are subject to heavy foot traffic and some vehicular traffic. The ratings are based on the soil properties that affect the ease of developing camp areas and the performance of the areas after development. Slope, stoniness, and depth to bedrock or a cemented pan are the main concerns affecting the development of camp areas.

The soil properties that affect the performance of the areas after development are those that influence trafficability and promote the growth of vegetation, especially in heavily used areas. For good trafficability, the surface of camp areas should absorb rainfall readily, remain firm under heavy foot traffic, and not be dusty when dry. The soil properties that influence trafficability are texture of the surface layer, depth to a water table, ponding, flooding, permeability, and large stones. The soil properties that affect the growth of plants are depth to bedrock or a cemented pan, permeability, and toxic substances in the soil.

Picnic areas are subject to heavy foot traffic. Most vehicular traffic is confined to access roads and parking areas. The ratings are based on the soil properties that affect the ease of developing picnic areas and that influence trafficability and the growth of vegetation after development. Slope and stoniness are the main concerns affecting the development of picnic areas. For good trafficability, the surface of picnic areas should absorb rainfall readily, remain firm under heavy foot traffic, and not be dusty when dry. The soil properties that influence trafficability are texture of the surface layer, depth to a water table, ponding, flooding, permeability, and large stones. The soil properties that affect the growth of plants are depth to bedrock or a cemented pan, permeability, and toxic substances in the soil.

Playgrounds require soils that are nearly level, are free of stones, and can withstand intensive foot traffic. The ratings are based on the soil properties that affect the ease of developing playgrounds and that influence trafficability and the growth of vegetation after development. Slope and stoniness are the main concerns affecting the development of playgrounds. For good trafficability, the surface of the playgrounds should absorb rainfall readily, remain firm under heavy foot traffic, and not be dusty when dry. The soil properties that influence trafficability are texture of the surface layer, depth to a water table, ponding, flooding, permeability, and large stones. The soil properties that affect the growth of plants are depth to bedrock or a cemented pan, permeability, and toxic substances in the soil.

Paths and trails for hiking and horseback riding should require little or no slope modification through cutting and filling. The ratings are based on the soil properties that affect trafficability and erodibility. These properties are stoniness, depth to a water table, ponding, flooding, slope, and texture of the surface layer.

Golf fairways are subject to heavy foot traffic and some light vehicular traffic. Cutting or filling may be required. Irrigation is not considered in the ratings. The ratings are based on the soil properties that affect plant growth and trafficability after vegetation is established. The properties that affect plant growth are reaction; depth to a water table; ponding; depth to bedrock or a cemented pan; the available water capacity in the upper 40 inches; the content of salts, sodium, or calcium carbonate; and sulfidic materials. The properties that affect trafficability are flooding, depth to a water table, ponding, slope, stoniness, and the amount of sand, clay, or organic matter in the surface layer. The suitability of the soil for traps, tees, roughs, and greens is not considered in the ratings.

RECREATIONAL INTERPRETATIONS--Continued
Labette County, Kansas

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
021ES:							
Eram	50	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Slope	1.00
		Restricted permeability	0.94	Restricted permeability	0.94	Depth to saturated zone	1.00
		Slope	0.04	Slope	0.04	Restricted permeability	0.94
						Depth to bedrock	0.80
Shidler	40	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
						Slope	1.00
						Content of large stones	0.32
125BF:							
Bates	50	Somewhat limited		Somewhat limited		Somewhat limited	
		Restricted permeability	0.15	Restricted permeability	0.15	Depth to bedrock	0.35
						Restricted permeability	0.15
						Slope	0.03
Collinsville	40	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
						Slope	0.13
Ae:							
Apperson	85	Very limited		Somewhat limited		Very limited	
		Depth to saturated zone	1.00	Restricted permeability	0.94	Depth to saturated zone	1.00
		Restricted permeability	0.94	Depth to saturated zone	0.94	Restricted permeability	0.94
						Slope	0.00
AED:							
Arents, Earthen Dam	100	Not rated		Not rated		Not rated	
Be:							
Bates	85	Somewhat limited		Somewhat limited		Somewhat limited	
		Restricted permeability	0.60	Restricted permeability	0.60	Restricted permeability	0.60
						Slope	0.00
Bf:							
Bates	85	Somewhat limited		Somewhat limited		Somewhat limited	
		Restricted permeability	0.60	Restricted permeability	0.60	Slope	0.87
						Depth to bedrock	0.80
						Restricted permeability	0.60
Bm:							
Bates	50	Somewhat limited		Somewhat limited		Very limited	
		Restricted permeability	0.60	Restricted permeability	0.60	Slope	1.00
						Depth to bedrock	0.71
						Restricted permeability	0.60
Collinsville	35	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Slope	0.16	Slope	0.16	Slope	1.00
Bo:							
Bolivar	65	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Slope	1.00
						Depth to bedrock	0.71
Hector	25	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Slope	0.63	Slope	0.63	Slope	1.00
Br:							
Brazilton	100	Very limited		Very limited		Very limited	
		Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
						Slope	0.13
Cd:							
Catoosa	90	Somewhat limited		Somewhat limited		Somewhat limited	
		Restricted permeability	0.15	Restricted permeability	0.15	Restricted permeability	0.15
						Slope	0.00
Ch:							
Cherokee	100	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Restricted permeability	0.15	Restricted permeability	0.15	Restricted permeability	0.15
De:							
Dennis	90	Very limited		Somewhat limited		Very limited	

RECREATIONAL INTERPRETATIONS--Continued
Labette County, Kansas

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
		Depth to saturated zone	1.00	Restricted permeability	0.94	Depth to saturated zone	1.00
		Restricted permeability	0.94	Depth to saturated zone	0.94	Restricted permeability	0.94
						Slope	0.00
Ef:							
Eram	85	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Restricted permeability	0.94	Restricted permeability	0.94	Restricted permeability	0.94
						Slope	0.00
Eh:							
Eram	88	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Restricted permeability	0.94	Restricted permeability	0.94	Restricted permeability	0.94
						Slope	0.87
						Depth to bedrock	0.65
Eo:							
Eram	60	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Restricted permeability	0.94	Restricted permeability	0.94	Slope	1.00
		Slope	0.00	Slope	0.00	Restricted permeability	0.94
						Depth to bedrock	0.65
Lebo	20	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Slope	1.00
						Depth to bedrock	0.29
Es:							
Eram	50	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Restricted permeability	0.94	Restricted permeability	0.94	Restricted permeability	0.94
						Slope	0.87
						Depth to bedrock	0.65
Nowata	30	Somewhat limited		Somewhat limited		Somewhat limited	
		Restricted permeability	0.15	Restricted permeability	0.15	Slope	0.87
						Restricted permeability	0.15
						Depth to bedrock	0.06
He:							
Hepler	95	Very limited		Somewhat limited		Somewhat limited	
		Flooding	1.00	Depth to saturated zone	0.19	Flooding	0.60
		Depth to saturated zone	0.39			Depth to saturated zone	0.39
HF:							
Hepler	95	Very limited		Somewhat limited		Very limited	
		Flooding	1.00	Flooding	0.40	Flooding	1.00
		Depth to saturated zone	0.39	Depth to saturated zone	0.19	Depth to saturated zone	0.39
		Restricted permeability	0.15	Restricted permeability	0.15	Restricted permeability	0.15
						Slope	0.00
Ka:							
Kanima	100	Not limited		Not limited		Somewhat limited	
						Slope	0.87
Kb:							
Kanima	95	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
Ke:							
Kenoma	85	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Restricted permeability	0.94	Restricted permeability	0.94	Restricted permeability	0.94
						Slope	0.00
Ln:							
Lanton	95	Very limited		Somewhat limited		Somewhat limited	
		Flooding	1.00	Restricted permeability	0.94	Depth to saturated zone	0.98
		Depth to saturated zone	0.98	Depth to saturated zone	0.75	Restricted permeability	0.94
		Restricted permeability	0.94			Flooding	0.60

RECREATIONAL INTERPRETATIONS--Continued
Labette County, Kansas

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
M-W:							
Miscellaneous Water-	100	Not rated		Not rated		Not rated	
Od:							
Olpe	50	Somewhat limited		Somewhat limited		Somewhat limited	
		Restricted permeability	0.94	Restricted permeability	0.94	Restricted permeability	0.94
						Slope	0.87
Dennis	35	Very limited		Somewhat limited		Very limited	
		Depth to saturated zone	1.00	Restricted permeability	0.94	Depth to saturated zone	1.00
		Restricted permeability	0.94	Depth to saturated zone	0.94	Restricted permeability	0.94
						Slope	0.87
Or:							
Orthents	100	Very limited		Very limited		Very limited	
		Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
						Slope	0.00
Os:							
Osage	93	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Ponding	1.00	Depth to saturated zone	1.00
		Flooding	1.00	Depth to saturated zone	1.00	Ponding	1.00
		Ponding	1.00	Restricted permeability	1.00	Restricted permeability	1.00
		Restricted permeability	1.00	Too clayey	1.00	Too clayey	1.00
		Too clayey	1.00			Flooding	0.60
Pe:							
Parsons	91	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Restricted permeability	0.94	Restricted permeability	0.94	Restricted permeability	0.94
Pt:							
Pits, Quarries	100	Not rated		Not rated		Not rated	
Sd:							
Shidler	50	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
						Slope	0.87
						Content of large stones	0.05
Catoosa	35	Somewhat limited		Somewhat limited		Somewhat limited	
		Restricted permeability	0.15	Restricted permeability	0.15	Slope	0.87
						Restricted permeability	0.15
						Depth to bedrock	0.01
Vc:							
Verdigris	85	Very limited		Somewhat limited		Very limited	
		Flooding	1.00	Flooding	0.40	Flooding	1.00
Vf:							
Verdigris	95	Very limited		Not limited		Somewhat limited	
		Flooding	1.00			Flooding	0.60
W:							
Water	100	Not rated		Not rated		Not rated	
Zb:							
Zaar	85	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Too clayey	1.00	Depth to saturated zone	1.00
		Too clayey	1.00	Restricted permeability	0.94	Too clayey	1.00
		Restricted permeability	0.94	Depth to saturated zone	0.83	Restricted permeability	0.94

RECREATIONAL INTERPRETATIONS--Continued
Labette County, Kansas

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Paths and trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value
021ES:					
Eram	50	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
				Depth to bedrock	0.80
				Slope	0.04
				Droughty	0.00
Shidler	40	Not limited		Very limited	
				Depth to bedrock	1.00
				Droughty	0.92
				Content of large stones	0.32
125BF:					
Bates	50	Not limited		Somewhat limited	
				Depth to bedrock	0.35
Collinsville	40	Not limited		Very limited	
				Depth to bedrock	1.00
				Droughty	0.98
Ae:					
Apperson	85	Somewhat limited		Somewhat limited	
		Depth to saturated zone	0.86	Depth to saturated zone	0.94
AED:					
Arents, Earthen Dam	100	Not rated		Not rated	
Be:					
Bates	85	Not limited		Somewhat limited	
				Depth to bedrock	0.46
Bf:					
Bates	85	Not limited		Somewhat limited	
				Depth to bedrock	0.80
Bm:					
Bates	50	Not limited		Somewhat limited	
				Depth to bedrock	0.71
Collinsville	35	Not limited		Very limited	
				Depth to bedrock	1.00
				Droughty	1.00
				Slope	0.16
Bo:					
Bolivar	65	Not limited		Somewhat limited	
				Depth to bedrock	0.71
				Slope	0.63
				Droughty	0.26
Hector	25	Not limited		Very limited	
				Depth to bedrock	1.00
				Droughty	1.00
				Slope	0.63
Br:					
Brazilton	100	Not limited		Not limited	
Cd:					
Catoosa	90	Not limited		Somewhat limited	
				Depth to bedrock	0.01
Ch:					
Cherokee	100	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
De:					
Dennis	90	Somewhat limited		Somewhat limited	
		Depth to saturated zone	0.86	Depth to saturated zone	0.94
Ef:					
Eram	85	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
				Depth to bedrock	0.80
				Droughty	0.15
Eh:					
Eram	88	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
				Depth to bedrock	0.65
				Droughty	0.06
Eo:					
Eram	60	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
				Depth to bedrock	0.65
				Droughty	0.05
				Slope	0.00
Lebo	20	Not limited		Somewhat limited	

RECREATIONAL INTERPRETATIONS--Continued
Labette County, Kansas

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Paths and trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value
				Slope	0.63
				Depth to bedrock	0.29
Es:					
Eram	50	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
				Depth to bedrock	0.65
				Droughty	0.06
Nowata	30	Not limited		Somewhat limited	
				Depth to bedrock	0.06
He:					
Hepler	95	Not limited		Somewhat limited	
				Flooding	0.60
				Depth to saturated zone	0.19
HF:					
Hepler	95	Somewhat limited		Very limited	
		Flooding	0.40	Flooding	1.00
				Depth to saturated zone	0.19
Ka:					
Kanima	100	Not limited		Somewhat limited	
				Droughty	0.37
Kb:					
Kanima	95	Somewhat limited		Very limited	
		Slope	0.50	Slope	1.00
				Droughty	0.37
Ke:					
Kenoma	85	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
Ln:					
Lanton	95	Somewhat limited		Somewhat limited	
		Depth to saturated zone	0.44	Depth to saturated zone	0.75
				Flooding	0.60
M-W:					
Miscellaneous Water	100	Not rated		Not rated	
Od:					
Olpe	50	Not limited		Somewhat limited	
				Droughty	0.79
Dennis	35	Somewhat limited		Somewhat limited	
		Depth to saturated zone	0.86	Depth to saturated zone	0.94
Or:					
Orthents	100	Not limited		Somewhat limited	
				Droughty	0.12
Os:					
Osage	93	Very limited		Very limited	
		Depth to saturated zone	1.00	Ponding	1.00
		Ponding	1.00	Depth to saturated zone	1.00
		Too clayey	1.00	Too clayey	1.00
				Flooding	0.60
Pe:					
Parsons	91	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
Pt:					
Pits, Quarries	100	Not rated		Not rated	
Sd:					
Shidler	50	Not limited		Very limited	
				Depth to bedrock	1.00
				Droughty	0.92
				Content of large stones	0.05
Catoosa	35	Not limited		Somewhat limited	
				Depth to bedrock	0.01
Vc:					
Verdigris	85	Somewhat limited		Very limited	
		Flooding	0.40	Flooding	1.00
Vf:					
Verdigris	95	Not limited		Somewhat limited	
				Flooding	0.60
W:					
Water	100	Not rated		Not rated	

RECREATIONAL INTERPRETATIONS--Continued
Labette County, Kansas

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Paths and trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value
Zb:					
Zaar	85	Very limited Too clayey Depth to saturated zone	 1.00 0.62	Very limited Too clayey Depth to saturated zone	 1.00 0.83

WILDLIFE INTERPRETATIONS
Labette County, Kansas

Use and Explanation of Wildlife Interpretations

Soils directly affect the kind and amount of vegetation that is available to wildlife as food and cover. They also affect the development of water impoundments. The kind and abundance of wildlife that populate an area depend largely on the amount and distribution of food, cover, water, and living space. If any one of these elements is missing, inadequate, or inaccessible, wildlife will be scarce or will not inhabit the area. If the soils have the potential, wildlife habitat can be created or improved by planting appropriate vegetation, properly managing the existing plant cover, and fostering the natural establishment of desirable plants.

In the Wildlife Interpretations table, the soils in the survey area are rated according to their potential for providing habitat for various kinds of wildlife. This information can be used in planning parks, wildlife refuges, nature study areas, and other developments for wildlife; in selecting soils that are suitable for establishing, improving, or maintaining specific elements of wildlife habitat; and in determining the intensity of management needed for each element of the habitat.

Suitability Ratings

The potential of the soil is rated good, fair, poor, or very poor.

Good – means that the element of wildlife habitat or the kind of habitat is easily created, improved, or maintained. Few or no limitations affect management, and satisfactory results can be expected if the soil is used for the designated purpose.

Fair – means that the element of wildlife habitat or kind of habitat can be created, improved, or maintained in most places. Moderately intensive management is required for satisfactory results.

Poor – means that limitations are severe for the designated element or kind of wildlife habitat. Habitat can be created, improved, or maintained in most places, but management is difficult and requires intensive effort.

Very Poor – means that limitations are very severe for the designated element or kind of wildlife habitat. Habitat is difficult to create, improve, or maintain in most places, and management is difficult and requires intensive effort.

Description of Wildlife Habitat Elements

Openland habitat consists of croplands, pastures, meadows, and areas that are overgrown with grasses, herbs, shrubs, and vines. These areas produce grain and seed crops, grasses and legumes, and wild herbaceous plants. The kind of wildlife attracted to these areas include bobwhite quail, pheasant, meadowlark, field sparrow, killdeer, cottontail rabbit, red fox, and coyote.

Woodland habitat consists of hardwood or conifers, or a mixture of these and associated grasses, legumes and wild herbaceous plants. Examples of wildlife attracted to this habitat are wild turkey, thrushes, woodpeckers, owl, tree squirrels, raccoon, and deer.

Wetland habitat consists of water–tolerant plants in open, marshy or swampy, shallow water areas. Examples of wildlife attracted to this habitat are ducks, geese, herons, bitterns, rails, kingfishers, shorebirds, muskrat, mink, and beaver.

The elements of wildlife habitat are described in the following paragraphs.

Grain and seed crops are domestic grains and seed–producing herbaceous plants. Soil properties and features that affect the growth of grain and seed crops are depth of the root zone, texture of the surface layer, available water capacity, wetness, slope, surface stoniness, and flooding. Soil temperature and soil moisture also are considerations. Examples of grain and seed crops are corn, wheat, oats, and barley.

Grasses and legumes are domestic perennial grasses and herbaceous legumes. Soil properties and features that affect the growth of grasses and legumes are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, flooding, and slope. Soil temperature and soil moisture also are considerations. Examples of grasses and legumes are fescue, lovegrass, bromegrass, clover, and alfalfa.

Wild herbaceous plants are native or naturally established grasses and forbs, including weeds. Soil properties and features that affect the growth of these plants are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, and flooding. Soil temperature and soil moisture also are considerations. Examples of wild herbaceous plants are bluestem, goldenrod, beggarweed, wheatgrass, and grama.

Hardwood trees and woody understory produce nuts or other fruit, buds, catkins, twigs, bark, and foliage. Soil properties and features that affect the growth of hardwood trees and shrubs are depth of the root zone, available water capacity, and wetness. Examples of these plants are oak, poplar, cherry, sweetgum, apple, hawthorn, dogwood, hickory, blackberry, and blueberry. Examples of fruit–producing shrubs that are suitable for planting on soils rated good are Russian–olive, autumn–olive, and crabapple.

Coniferous plants furnish browse and seeds. Soil properties and features that affect the growth of coniferous trees, shrubs, and ground cover are depth of the root zone, available water capacity, and wetness. Examples of coniferous plants are pine, spruce, fir, cedar, and juniper.

Shrubs are bushy woody plants that produce fruit, buds, twigs, bark, and foliage. Soil properties and features that affect the growth of shrubs are depth of the root zone, available water capacity, salinity, and soil moisture. Examples of shrubs are fragrant sumac, chokecherry, American plum, sand plum, and gorden currant.

Wetland plants are annual and perennial wild herbaceous plants that grow on moist or wet sites. Submerged or floating aquatic plants are excluded. Soil properties and features affecting wetland plants are texture of the surface layer, wetness, reaction, salinity, slope, and surface stoniness. Examples of wetland plants are smartweed, wild millet, saltgrass, cordgrass, rushes, sedges, and cattails.

WILDLIFE INTERPRETATIONS--Continued
Labette County, Kansas

Shallow water areas have an average depth of less than 5 feet. Some are naturally wet areas. Others are created by dams, levees, or other water-control structures. Soil properties and features affecting shallow water areas are depth to bedrock, wetness, surface stoniness, slope, and permeability. Examples of shallow water areas are marshes, waterfowl feeding areas, and ponds.

The habitat for various kinds of wildlife is described in the following paragraphs.

Habitat for openland wildlife consists of cropland, pasture, meadows, and areas that are overgrown with grasses, herbs, shrubs, and vines. These areas produce grain and seed crops, grasses and legumes, and wild herbaceous plants. Wildlife attracted to these areas include bobwhite quail, pheasant, meadowlark, field sparrow, cottontail, red fox and coyote.

Habitat for woodland wildlife consists of areas of deciduous and/or coniferous plants and associated grasses, legumes, and wild herbaceous plants. Wildlife attracted to these areas include wild turkey, thrushes, woodpeckers, squirrels, gray fox, raccoon, and deer.

Habitat for wetland wildlife consists of open, marshy or swampy shallow water areas. Some of the wildlife attracted to such areas are ducks, geese, herons, shore birds, muskrat, mink, and beaver.

Habitat for rangeland wildlife consists of areas of shrubs and wild herbaceous plants. Wildlife attracted to rangeland include antelope, deer, cottontail rabbit, prairie chicken, meadowlark, quail, and pheasant.

WILDLIFE INTERPRETATIONS
Labette County, Kansas

Map symbol and soil name	Potential for habitat elements								Potential as habitat for--			
	Grain and seed crops	Grasses and legumes	Wild herba-ceous plants	Hard-wood trees	Conif-erous plants	Shrubs	Wetland plants	Shallow water areas	Open-land wild-life	Wood-land wild-life	Wetland wild-life	Range-land wild-life
021ES:												
ERAM	Fair	Good	Good	Good	Good	---	Very poor	Very poor	Good	Fair	Very poor	---
SHIDLER	Very poor	Very poor	Poor	---	---	Poor	Very poor	Very poor	Very poor	---	Very poor	Poor
125BF:												
BATES	Good	Good	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor	Good
COLLINSVILLE	Very poor	Poor	Poor	Very poor	Very poor	---	Very poor	Very poor	Poor	Very poor	Very poor	Fair
Ae:												
APPERSON	Good	Good	Fair	Good	Good	---	Poor	Poor	Good	Good	Poor	---
AED:												
ARENTS, EARTHEN DAM	---	---	---	---	---	---	---	---	---	---	---	---
Be:												
BATES	Good	Good	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor	Good
Bf:												
BATES	Good	Good	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor	Good
Bm:												
BATES	Good	Good	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor	Good
COLLINSVILLE	Very poor	Poor	Poor	Very poor	Very poor	---	Very poor	Very poor	Poor	Very poor	Very poor	---
Bo:												
BOLIVAR	Fair	Good	Good	Good	Good	---	Very poor	Very poor	Good	Good	Very poor	---
HECTOR	Very poor	Poor	Poor	Poor	Very poor	---	Very poor	Very poor	Poor	Poor	Very poor	---
Br:												
BRAZILTON	Fair	Good	Fair	Fair	Fair	Fair	Poor	Poor	Fair	Fair	Poor	Fair
Cd:												
CATOOSA	Fair	Good	Good	Good	Good	---	Poor	Very poor	Good	Good	Very poor	---
Ch:												
CHEROKEE	Fair	Good	Fair	Fair	Fair	Fair	Fair	Fair	Fair	---	Fair	Fair
De:												
DENNIS	Good	Good	Good	Good	Good	---	Poor	Poor	Good	Good	Poor	---
Ef:												
ERAM	Good	Good	Good	Good	Good	---	Poor	Very poor	Good	Fair	Very poor	---
Eh:												
ERAM	Fair	Good	Good	Good	Good	---	Very poor	Very poor	Good	Fair	Very poor	---
Eo:												
ERAM	Fair	Good	Good	Good	Good	---	Very poor	Very poor	Good	Fair	Very poor	---
LEBO	Poor	Poor	Good	Good	Good	---	Very poor	Very poor	Fair	Good	Very poor	---
Es:												
ERAM	Good	Good	Good	Good	Good	---	Poor	Very poor	Good	Fair	Very poor	---
NOWATA	Fair	Good	Good	Good	Good	Fair	Poor	Very poor	Good	Good	Very poor	Fair
He:												
HEPLER	Fair	Good	Good	Good	Good	Good	Good	Fair	Good	Good	Fair	Good
HF:												
HEPLER	Fair	Good	Good	Good	Good	Good	Good	Fair	Good	Good	Fair	Good

WILDLIFE INTERPRETATIONS--Continued
Labette County, Kansas

Map symbol and soil name	Potential for habitat elements								Potential as habitat for--			
	Grain and seed crops	Grasses and legumes	Wild herba-ceous plants	Hard-wood trees	Conif-erous plants	Shrubs	Wetland plants	Shallow water areas	Open-land wild-life	Wood-land wild-life	Wetland wild-life	Range-land wild-life
Ka: KANIMA	Poor	Fair	Fair	Fair	Poor	---	Very poor	Very poor	Fair	Fair	Very poor	---
Kb: KANIMA	Poor	Fair	Fair	Fair	Poor	---	Very poor	Very poor	Fair	Fair	Very poor	---
Ke: KENOMA	Good	Good	Fair	Fair	Fair	Fair	Poor	Fair	Good	Fair	Poor	Fair
Ln: LANTON	Fair	Good	Fair	Good	Good	Good	Fair	Good	Fair	Good	Fair	---
M-W: MISCELLANEOUS WATER	---	---	---	---	---	---	---	---	---	---	---	---
Od: OLPE	Good	Good	Good	Fair	Fair	Good	Poor	Very poor	Good	Fair	Very poor	Good
DENNIS	Good	Good	Good	Good	Good	---	Poor	Very poor	Good	Good	Very poor	---
Or: ORTHENTS	---	---	---	---	---	---	---	---	---	---	---	---
Os: OSAGE	Fair	Fair	Fair	Fair	Fair	---	Good	Good	Fair	Good	Good	---
Pe: PARSONS	Fair	Good	Good	Good	Good	---	Fair	Poor	Good	Good	Fair	---
Pt: Pits, quarries	---	---	---	---	---	---	---	---	---	---	---	---
Sd: SHIDLER	Very poor	Very poor	Poor	---	---	Poor	Very poor	Very poor	Very poor	---	Very poor	Poor
Catoosa	Fair	Good	Good	Good	Good	---	Poor	Very poor	Good	Good	Very poor	---
Vc: VERDIGRIS	Poor	Fair	Fair	Good	Good	Good	Poor	Fair	Fair	Good	Poor	Good
Vf: VERDIGRIS	Good	Good	Good	Good	Good	Good	Poor	Fair	Good	Good	Poor	Good
W: WATER	---	---	---	---	---	---	---	---	---	---	---	---
Zb: ZAAR	Fair	Fair	Fair	Good	Good	Good	Poor	Fair	Fair	Good	Poor	Fair

YIELDS PER ACRE OF PASTURE AND HAYLAND
Labette County, Kansas

Use and Explanation of Pastureland and Hayland Interpretations

This subsection provides information concerning the suitability of soils for the production of pasture and hayland. This subsection may contain pasture and hayland suitability groupings, land capability and yield estimates, yield estimates for individual grasses or legumes, or other information pertaining to the production of forage.

Pasture and Hayland Suitability Groupings

Soils are placed in pasture and hayland groups according to their suitability for the production of forage. The soils in each group are enough alike to be suited to the same grasses or legumes, to have similar limitations and hazards, to require similar management, and to have similar productivity and other responses to management. Thus, the pasture and hayland suitability group is a convenient way of grouping the soils for their management. If used, these groupings are identified and described in other reports in the subsection.

Yield Estimates

The average yields per acre that can be expected of the principal pasture or hayland crops, under a high level of management, are presented in this subsection. In any given year, yields may be higher or lower than those indicated in the tables because of variations in rainfall or other climatic factors. The yields are based mainly on the experience and records of farmers, conservationists, and extension agents. Available yield data from nearby counties and results of field trials and demonstrations are also considered.

Under good management, proper grazing is essential for the production of high quality forage, stand survival, and erosion control. Proper grazing helps plants maintain sufficient and generally vigorous top growth during the growing season. Brush control is essential in many areas, and weed control generally is needed. Rotation grazing and renovation are also important management practices.

The Pasture and Hayland table show yield estimates in tons per acre and animal unit months for pasture and hayland groups. An animal unit month is the amount of forage required by one animal unit (AU) for 30 days. On animal unit (AU) is one (1000 pound) mature cow and a calf up to weaning age (usually six months of age) or their equivalent. The Natural Resources Conservation Service uses 900 pounds of air dry forage as the amount needed to meet this requirement. To maintain a healthy and vigorous plant community, the degree of use should never be greater than 50 percent. Therefore only 25 percent of the total biomass grown is considered consumed by the grazing animal. Animal Unit Months can be converted to air dry pounds per acre production by multiplying the AUM by 30 days, then by 30 pounds per day, and then by four. This figure is the amount of total forage production.

Planners of management systems for individual fields or farms should consider the detailed information given in the description of each soil in the Nontechnical Description section. Specific information on plants and yields can be obtained from the local office of the Natural Resources Conservation Service or the Cooperative Extension Service.

YIELDS PER ACRE OF PASTURE AND HAYLAND--Continued
Labette County, Kansas

(Yields in the "N" columns are for nonirrigated soils; those in the "I" columns are for irrigated soils. Yields are those that can be expected under a high level of nonirrigated and irrigated management by component. Absence of a yield indicates that the soil is not suited to the crop or the crop generally is not grown on the soil)
Animal-unit-month: The amount of forage or feed required to feed one animal unit (one cow, one horse, one mule, five sheep, or five goats) for 30 days.

Map symbol and soil name	Land capability		Alfalfa hay		Smooth bromegrass		Tall fescue		Warm season grasses	
	N	I	N	I	N	I	N	I	N	I
			Tons	Tons	AUM	AUM	AUM	AUM	AUM	AUM
021ES:										
Eram	6e	---	---	---	---	---	---	---	---	---
Shidler	7s	---	---	---	---	---	---	---	---	---
125BF:										
Bates	4e	---	4.30	---	3.80	---	4.50	---	---	---
Collinsville	6e	---	---	---	---	---	---	---	---	---
Ae:										
Apperson	2e	---	---	---	---	---	---	---	1.20	---
AED:										
Arents, Earthen Dam	8	---	---	---	---	---	---	---	---	---
Be:										
Bates	2e	---	---	---	---	---	---	---	1.20	---
Bf:										
Bates	3e	---	---	---	---	---	---	---	1.20	---
Bm:										
Bates	6e	---	---	---	---	---	---	---	0.72	---
Collinsville	6e	---	---	---	---	---	---	---	0.32	---
Bo:										
Bolivar	6e	---	---	---	---	---	---	---	0.56	---
Hector	7e	---	---	---	---	---	---	---	0.14	---
Br:										
Brazilton	3e	---	---	---	---	---	---	---	1.00	---
Cd:										
Catoosa	2e	---	---	---	---	---	---	---	1.20	---
Ch:										
Cherokee	2s	---	---	---	---	---	---	---	1.00	---
De:										
Dennis	2e	---	---	---	---	---	---	---	1.20	---
Ef:										
Eram	3e	---	---	---	---	---	---	---	1.00	---
Eh:										
Eram	4e	---	---	---	---	---	---	---	1.00	---
Eo:										
Eram	6e	---	---	---	---	---	---	---	0.70	---
Lebo	6e	---	---	---	---	---	---	---	0.36	---
Es:										
Eram	4e	---	---	---	---	---	---	---	0.70	---
Nowata	4e	---	---	---	---	---	---	---	0.40	---
He:										
Hepler	2w	---	---	---	---	---	---	---	1.80	---
HF:										
Hepler	5w	---	---	---	---	---	5.00	---	---	---
Ka:										
Kanima	6s	---	---	---	---	---	---	---	0.00	---
Kb:										
Kanima	7s	---	---	---	---	---	---	---	0.00	---
Ke:										
Kenoma	3e	---	---	---	---	---	---	---	1.00	---
Ln:										
Lanton	2w	---	---	---	---	---	---	---	1.80	---
M-W:										
Miscellaneous Water	---	---	---	---	---	---	---	---	---	---

YIELDS PER ACRE OF PASTURE AND HAYLAND--Continued
Labette County, Kansas

(Yields in the "N" columns are for nonirrigated soils; those in the "I" columns are for irrigated soils. Yields are those that can be expected under a high level of nonirrigated and irrigated management by component. Absence of a yield indicates that the soil is not suited to the crop or the crop generally is not grown on the soil)
Animal-unit-month: The amount of forage or feed required to feed one animal unit (one cow, one horse, one mule, five sheep, or five goats) for 30 days.

Map symbol and soil name	Land capability		Alfalfa hay		Smooth bromegrass		Tall fescue		Warm season grasses	
	N	I	N	I	N	I	N	I	N	I
			Tons	Tons	AUM	AUM	AUM	AUM	AUM	AUM
Od:										
Olpe	4e	---	---	---	---	---	---	---	0.72	---
Dennis	4e	---	---	---	---	---	---	---	0.48	---
Or:										
Orthents	4e	---	---	---	---	---	---	---	0.00	---
Os:										
Osage	3w	---	---	---	---	---	---	---	1.50	---
Pe:										
Parsons	2s	---	---	---	---	---	---	---	1.00	---
Pt:										
Pits, Quarries	---	---	---	---	---	---	---	---	---	---
Sd:										
Shidler	6e	---	---	---	---	---	---	---	0.36	---
Catoosa	3e	---	---	---	---	---	---	---	0.48	---
Vc:										
Verdigris	5w	---	---	---	---	---	---	---	1.80	---
Vf:										
Verdigris	2w	---	---	---	---	---	---	---	1.80	---
W:										
Water	---	---	---	---	---	---	---	---	---	---
Zb:										
Zaar	3w	---	---	---	---	---	---	---	1.00	---

CONSERVATION TREE AND SHRUB MANAGEMENT
Labette County, Kansas

A Conservation Tree/Shrub Suitability Group (CTSG), formerly Windbreak Suitability Group, is a physiographic unit or area having similar climatic and edaphic characteristics that control the selection and height growth of trees and shrubs.

In this table, the Conservation Tree and Shrub Grouping is expressed as a group index number. The group index for Conservation Tree and Shrub groups (CTSG) are a guide for species best suited for different kinds of soil and for prediction height, growth, and effectiveness. The groupings can be used when selection woody plants for windbreaks, wildlife plantings riparian buffers, reforestation, other environmental plantings, recreation, landscaping, wetland restoration or enhancement and critical area plantings. CTSG's are developed to assure satisfactory species selection and adaptation to specific conditions of soil, climate and physiography. CTSG's are a guide for selection species best suited for different kinds of soil and prediction height growth and effectiveness.

All soil series mapped in the state have been placed in 10 groups of similar soil characteristics. Groups 1, 2, 3, 4, 6, and 9 are further divided into subgroups. In addition, all groups provide information by Major Land Resource Areas.

Each tree or shrub species has certain climatic and physiographic limits. Within these parameters a tree or shrub may be well or poorly suited because of soil characteristics. Each tree or shrub also has definable potentials of height growth depending on the factors just mentioned. Accurate definitions of potential heights are necessary for proper windbreak planning and design.

Windbreaks protect livestock, buildings, roads and yards from wind and snow. They also protect fruit trees and gardens, and they furnish habitat for wildlife. Several rows of low–growing and high–growing broadleaf and coniferous trees and shrubs provide the most protection.

Field windbreaks are narrow plantings made at right angles to the prevailing wind and at specific intervals across the field. The interval depends on the erodibility of the soil. Field windbreaks protect cropland and crops from wind, help to keep snow on the fields, and provide food and cover for wildlife.

Environmental plantings help to beautify and screen houses and other buildings and to abate noise. The plants, mostly evergreen shrubs and trees, are closely spaced. To ensure plant survival, a healthy planting stock of suitable species should be planted properly on a well prepared site and maintained in good condition.

Windbreaks are often planted on land that did not grow trees originally. Knowledge of how trees perform on such land can be gained only by observing and recording their performance where trees have been planted and survived. The problem is compounded by the fact that many favorite windbreak species are not indigenous to the areas in which they are planted.

The Kansas Field Office Technical Guide Notice KS–230, Conservation Tree and Shrub Plantings Suitability Groups shows the adapted species listing for each group index number. Showing the height that locally grown trees and shrubs are expected to reach in 20 years on various soils. The estimates are based on measurements and observation of established plantings that have been given adequate care. This information should be used to determine the placement of a windbreak, the area protected and the arrangement of species.

A number of attributes are included in the CTSG species tables for each group number found in this section of the Field Office Technical Guide. These attributes were rated subjectively and assigned a relative value to further assist those unfamiliar with individual species characteristics or desirability for the intended use. Definitions and explanations can be found. Additional information on planning windbreaks and screens and planting and caring for trees and shrubs can be obtained from the local office of the Natural Resources Conservation Service or of the Cooperative Extension Service or from a commercial nursery. See part 537 of the National Forestry Manual for additional information.

In the Tree and Shrub Management table interpretive ratings are given for various aspects of forest and conservation tree and shrub management. Some rating class terms indicate the degree to which the soils are suited to a specified forest management practice. Well suited indicates that the soil has features that are favorable for the specified practice and has no limitations. Good performance can be expected, and little or no maintenance is needed. Moderately well suited indicates that the soil has features that are moderately favorable for the specified practice. One or more soil properties are less than desirable and fair performance can be expected. Some maintenance is needed. Poorly suited indicates that the soil has one or more properties that are unfavorable for the specified practice. Overcoming the unfavorable properties requires special design, extra maintenance, and costly alteration. Unsuited indicates that the expected performance of the soil is unacceptable for the specified practice or that extreme measures are needed to overcome the undesirable soil properties.

The paragraphs that follow indicate the soil properties considered in rating the soils for forest and conservation tree and shrub management practices. More detailed information about the criteria used in the ratings is available in the "National Forestry Manual," which is available in local offices of the Natural Resources Conservation Service or on the Internet. Also, in the Kansas Field Office Technical Guide Notice KS–230, Conservation Tree and Shrub Plantings Suitability Groups.

Ratings in the columns suitability for hand planting and suitability for mechanical planting are based on slope, depth to a restrictive layer, content of sand, plasticity index, rock fragments on or below the surface, depth to a water table, and ponding. The soils are described as well suited, moderately well suited, poorly suited, or unsuited to these methods of planting. It is assumed that necessary site preparation is completed before seedlings are planted.

Ratings in the column suitability for mechanical site preparation (surface) are based on slope, depth to a restrictive layer, plasticity index, rock fragments on or below the surface, depth to a water table, and ponding. The soils are described as well suited, poorly suited, or unsuited to this management activity. The part of the soil from the surface to a depth of about 1–foot is considered in the ratings.

Ratings in the column suitability for mechanical site preparation (deep) are based on slope, depth to a restrictive layer, rock fragments on or below the surface, depth to a water table, and ponding. The soils are described as well suited, poorly suited, or unsuited to this management activity. The part of the soil from the surface to a depth of about 3 feet is considered in the ratings.

Ratings in the column potential for seedling mortality are based on flooding, ponding, depth to a water table, content of lime, reaction, salinity, available water capacity, soil moisture regime, soil temperature regime, aspect, and slope. The soils are described as having a low, moderate, or high potential for seedling mortality. See the National Forestry Manual, Subpart B for criteria used in rating management concerns. Specific information on plants and yields can be obtained from the local office of the Natural Resources Conservation Service or the Cooperative Extension Service.

CONSERVATION TREE AND SHRUB MANAGEMENT
Labette County,
Kansas

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. Pines and spruces are prone to disease problems. See text for further explanation of ratings in this table.)

Map symbol and soil name	Wind break Group	Suitability for hand planting	Suitability for mechanical planting	Suitability for mechanical site preparation (surface)	Suitability for mechanical site preparation (deep)	Potential for seedling mortality
		Rating class and limiting features	Rating class and limiting features	Rating class and limiting features	Rating class and limiting features	Rating class and limiting features
021ES:						
Eram	4C	Poorly suited Stickiness	Poorly suited Stickiness Slope	Poorly suited Stickiness	Well suited	High Wetness
Shidler	10	Well suited	Moderately suited Slope Rock fragments	Well suited	Unsuited Restrictive layer	Low
125BF:						
Bates	6D	Well suited	Well suited	Well suited	Well suited	Low
Collinsville	10	Moderately suited Rock fragments	Poorly suited Rock fragments	Poorly suited Rock fragments	Well suited	Low
Ae:						
Apperson	4C	Moderately suited Stickiness	Moderately suited Stickiness	Well suited	Well suited	High Wetness
AED:						
Arents, Earthen Dam-		Not rated	Not rated	Not rated	Not rated	Not rated
Be:						
Bates	6D	Well suited	Well suited	Well suited	Well suited	Low
Bf:						
Bates	6D	Moderately suited Stickiness	Moderately suited Slope Stickiness	Well suited	Well suited	Low
Bm:						
Bates	6D	Moderately suited Stickiness	Moderately suited Slope Stickiness	Well suited	Well suited	Low
Collinsville	10	Well suited	Moderately suited Slope	Well suited	Well suited	Low
Bo:						
Bolivar	6D	Well suited	Moderately suited Slope	Well suited	Well suited	Low
Hector	10	Well suited	Moderately suited Slope	Well suited	Well suited	Low
Br:						
Brazilton	4C	Moderately suited Stickiness	Moderately suited Stickiness	Well suited	Well suited	Low
Cd:						
Catoosa	6D	Poorly suited Stickiness	Poorly suited Stickiness	Poorly suited Stickiness	Well suited	Low
Ch:						
Cherokee	4C	Well suited	Well suited	Well suited	Well suited	High Wetness
De:						
Dennis	4C	Moderately suited Stickiness	Moderately suited Stickiness	Well suited	Well suited	High Wetness
Ef:						
Eram	4C	Poorly suited Stickiness	Poorly suited Stickiness	Poorly suited Stickiness	Well suited	High Wetness
Eh:						
Eram	4C	Poorly suited Stickiness	Poorly suited Stickiness Slope	Poorly suited Stickiness	Well suited	High Wetness
Eo:						
Eram	4C	Poorly suited Stickiness	Poorly suited Stickiness Slope	Poorly suited Stickiness	Well suited	High Wetness
Lebo	6D	Moderately suited Stickiness	Moderately suited Slope Stickiness	Well suited	Well suited	Low
Es:						
Eram	4C	Poorly suited Stickiness	Poorly suited Stickiness Slope	Poorly suited Stickiness	Well suited	High Wetness
Nowata	6D	Well suited	Moderately suited	Well suited	Well suited	Low

CONSERVATION TREE AND SHRUB MANAGEMENT
Labette County,
Kansas

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. Pines and spruces are prone to disease problems. See text for further explanation of ratings in this table.)

Map symbol and soil name	Wind break Group	Suitability for hand planting	Suitability for mechanical planting	Suitability for mechanical site preparation (surface)	Suitability for mechanical site preparation (deep)	Potential for seedling mortality
		Rating class and limiting features	Rating class and limiting features	Rating class and limiting features	Rating class and limiting features	Rating class and limiting features
			Rock fragments Slope			
He:						
Hepler	1	Well suited	Well suited	Well suited	Well suited	Low
HF:						
Hepler	1	Well suited	Well suited	Well suited	Well suited	Low
Ka:						
Kanima	10	Moderately suited Stickiness Rock fragments	Moderately suited Rock fragments Slope Stickiness	Poorly suited Rock fragments	Well suited	Low
Kb:						
Kanima	10	Moderately suited Stickiness Rock fragments	Poorly suited Slope Rock fragments Stickiness	Poorly suited Slope Rock fragments	Poorly suited Slope	Low
Ke:						
Kenoma	4C	Well suited	Well suited	Well suited	Well suited	High Wetness
Ln:						
Lanton	1	Moderately suited Stickiness	Moderately suited Stickiness	Well suited	Well suited	Low
M-W:						
Miscellaneous Water-		Not rated	Not rated	Not rated	Not rated	Not rated
Od:						
Olpe	6D	Well suited	Moderately suited Rock fragments Slope	Well suited	Well suited	Low
Dennis	4C	Moderately suited Stickiness	Moderately suited Slope Stickiness	Well suited	Well suited	High Wetness
Or:						
Orthents		Poorly suited Stickiness	Poorly suited Stickiness	Poorly suited Stickiness	Well suited	Low
Os:						
Osage	2	Poorly suited Stickiness	Poorly suited Stickiness	Poorly suited Stickiness	Well suited	High Wetness
Pe:						
Parsons	4C	Well suited	Well suited	Well suited	Well suited	High Wetness
Pt:						
Pits, Quarries		Not rated	Not rated	Not rated	Not rated	Not rated
Sd:						
Shidler	10	Well suited	Moderately suited Slope Rock fragments	Well suited	Unsuited Restrictive layer	Low
Catoosa	6D	Poorly suited Stickiness	Poorly suited Stickiness Slope	Poorly suited Stickiness	Well suited	Low
Vc:						
Verdigris	1	Well suited	Well suited	Well suited	Well suited	Low
Vf:						
Verdigris	1	Well suited	Well suited	Well suited	Well suited	Low
W:						
Water		Not rated	Not rated	Not rated	Not rated	Not rated
Zb:						
Zaar	4C	Poorly suited Stickiness	Poorly suited Stickiness	Poorly suited Stickiness	Well suited	High Wetness

ENGINEERING INDEX PROPERTIES
Labette County, Kansas

Engineering Index Properties table gives the engineering classifications and the range of index properties for the layers of each soil in the survey area. Depth to the upper and lower boundaries of each layer is indicated. Texture is given in the standard terms used by the U.S. Department of Agriculture. These terms are defined according to percentages of sand, silt, and clay in the fraction of the soil that is less than 2 millimeters in diameter. Loam, for example, is soil that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If the content of particles coarser than sand is 15 percent or more, an appropriate modifier is added, for example, gravelly. Textural terms are defined in the Glossary.

Classification of the soils is determined according to the Unified soil classification system (ASTM, 1998) and the system adopted by the American Association of State Highway and Transportation Officials (AASHTO, 1998). The Unified system classifies soils according to properties that affect their use as construction material. Soils are classified according to particle–size distribution of the fraction less than 3 inches in diameter and according to plasticity index, liquid limit, and organic matter content. Sandy and gravelly soils are identified as GW, GP, GM, GC, SW, SP, SM, and SC; silty and clayey soils as ML, CL, OL, MH, CH, and OH; and highly organic soils as PT. Soils exhibiting engineering properties of two groups can have a dual classification, for example, CL–ML.

The AASHTO system classifies soils according to those properties that affect roadway construction and maintenance. In this system, the fraction of a mineral soil that is less than 3 inches in diameter is classified in one of seven groups from A–1 through A–7 on the basis of particle–size distribution, liquid limit, and plasticity index. Soils in group A–1 are coarse grained and low in content of fines (silt and clay). At the other extreme, soils in group A–7 are fine grained. Highly organic soils are classified in group A–8 on the basis of visual inspection. If laboratory data are available, the A–1, A–2, and A–7 groups are further classified as A–1–a, A–1–b, A–2–4, A–2–5, A–2–6, A–2–7, A–7–5, or A–7–6. As an additional refinement, the suitability of a soil as subgrade material can be indicated by a group index number. Group index numbers range from 0 for the best subgrade material to 20 or higher for the poorest. The AASHTO classification for soils tested, with group index numbers in parentheses, is given in Engineering Index Properties table.

Rock fragments larger than 10 inches in diameter and 3 to 10 inches in diameter are indicated as a percentage of the total soil on a dry–weight basis. The percentages are estimates determined mainly by converting volume percentage in the field to weight percentage. Percentage (of soil particles) passing designated sieves is the percentage of the soil fraction less than 3 inches in diameter based on an ovendry weight. The sieves, numbers 4, 10, 40, and 200 (USA Standard Series), have openings of 4.76, 2.00, 0.420, and 0.074 millimeters, respectively. Estimates are based on laboratory tests of soils sampled in the survey area and in nearby areas and on estimates made in the field.

Liquid limit and plasticity index (Atterberg limits) indicate the plasticity characteristics of a soil. The estimates are based on test data from the survey area or from nearby areas and on field examination. The estimates of particle–size distribution, liquid limit, and plasticity index are generally rounded to the nearest 5 percent. Thus, if the ranges of gradation and Atterberg limits extend a marginal amount (1 or 2 percentage points) across classification boundaries, the classification in the marginal zone is generally omitted in the table.

ENGINEERING INDEX PROPERTIES--Continued
Labette County, Kansas

(Absence of an entry indicates that the data were not estimated.)

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
021ES:												
Eram----------	0-8	Silty clay loam	CL, ML, MH, CH	A-7-6, A-7-5, A-6, A-7	0	0	85-100	75-100	75-100	65-95	33-60	15-35
	8-26	Silty clay	CH, CL, ML, MH	A-7-5, A-7-6, A-6, A-7	0	0	85-100	65-100	60-100	65-98	37-65	15-45
	26-30	Weathered bedrock			---	---	---	---	---	---	---	---
Shidler--------	0-12	Silty clay loam	CH, CL, ML, MH	A-7-6, A-7-5, A-6, A-7	---	0-25	60-100	60-100	60-100	60-98	33-55	12-27
	12-16	Unweathered bedrock			---	---	---	---	---	---	---	---
125BF:												
Bates----------	0-9	Loam	CL, CL-ML, ML	A-4, A-6	0	0	90-100	85-100	80-100	55-90	20-40	3-15
	9-15	Loam	SM, CL, ML, SC	A-7-5, A-7, A-4, A-5, A-6, A-7-6	0	0	85-100	80-100	80-100	45-85	25-45	8-20
	15-31	Clay loam	ML, CL, SC, SM	A-7-5, A-7, A-6, A-2-7, A-2-6, A-2-5, A-2-4, A-2, A-4, A-5, A-7-6	---	0-15	70-90	70-90	50-80	20-70	20-45	8-28
	31-35	Weathered bedrock			---	---	---	---	---	---	---	---
Collinsville---	0-11	Fine sandy loam	CL, SC, CL-ML, ML, SC-SM, SM	A-2-4, A-4, A-2	---	0-15	85-100	85-100	75-100	30-75	15-32	NP-10
	11-17	Fine sandy loam	GM, GC-GM, GC, CL, ML, SC, SM, SC-SM, CL-ML	A-2, A-2-4, A-4	---	0-45	40-100	40-100	35-100	15-75	15-30	NP-10
	17-21	Unweathered bedrock			---	---	---	---	---	---	---	---
Ae:												
Apperson-------	0-7	Silty clay loam	CL, ML	A-7-6, A-7-5, A-6, A-7	0	0	100	100	95-100	75-98	33-50	12-30
	7-13	Silty clay loam	CL, ML	A-7-6, A-7-5, A-6, A-7	0	0	100	100	95-100	75-98	33-50	12-30
	13-24	Silty clay	CH, CL, ML, MH	A-7-6, A-7-5, A-7	0	0	100	100	95-100	80-99	41-70	20-40
	24-49	Silty clay	CH, CL, ML, MH	A-7-6, A-7-5, A-7	0	0	100	100	80-100	75-99	41-70	20-45
	49-53	Unweathered bedrock			---	---	---	---	---	---	---	---
AED:												
Arents, Earthen Dam----------	---	---	---	---	---	---	---	---	---	---	---	---
Be:												
Bates----------	0-9	Loam	ML, CL, CL-ML	A-4, A-6	0	0	100	100	80-100	55-90	20-40	3-15
	9-16	Loam	CL, CL-ML, ML	A-4, A-6	0	0-10	89-100	85-100	80-100	55-90	20-40	3-17
	16-30	Clay loam	CL, ML, SC, SM	A-7-6, A-5, A-7-5, A-4, A-6, A-7	0	0-15	83-100	80-100	80-100	45-85	25-45	8-25
	30-34	Weathered bedrock			---	---	---	---	---	---	---	---
Bf:												
Bates----------	0-7	Loam	CL, CL-ML, ML	A-4, A-6	0	0	100	100	80-100	55-90	20-40	3-15
	7-12	Loam	CL, CL-ML, ML	A-4, A-6	0	0-10	89-100	85-100	80-100	55-90	20-40	3-17
	12-26	Clay loam	CL, ML, SC, SM, CL-ML	A-5, A-7-5, A-7-6, A-4, A-6, A-7	0	0-15	83-100	80-100	80-100	45-85	25-45	8-25
	26-30	Weathered bedrock			---	---	---	---	---	---	---	---
Bm:												
Bates----------	0-8	Loam	CL, CL-ML, ML	A-4, A-6	0	0	100	100	80-100	55-90	20-40	3-15
	8-12	Loam	CL, CL-ML, ML	A-4, A-6	0	0-10	89-100	85-100	80-100	55-90	20-40	3-17
	12-27	Clay loam	CL, ML, SC, SM, CL-ML	A-5, A-7-5, A-7-6, A-4, A-6, A-7	0	0-15	83-100	80-100	80-100	45-85	25-45	8-25
	27-31	Unweathered bedrock			---	---	---	---	---	---	---	---
Collinsville---	0-8	Fine sandy loam	CL-ML, ML, SC-SM, SM, CL, SC	A-2-4, A-2, A-6, A-4	---	0-5	85-100	85-100	75-95	30-60	15-33	NP-10
	8-13	Fine sandy loam	CL, ML, SC, SM, SC-SM, CL-ML	A-2-4, A-2, A-6, A-4	---	0-25	55-100	55-100	50-95	20-85	15-30	NP-10
	13-17	Unweathered bedrock			---	---	---	---	---	---	---	---

ENGINEERING INDEX PROPERTIES--Continued
Labette County, Kansas

(Absence of an entry indicates that the data were not estimated.)

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
Bo:												
Bolivar--------	0-5	Fine sandy loam	ML, SM, CL, CL-ML, SC, SC-SM	A-4	0	0	100	90-100	70-100	40-80	18-30	NP-5
	5-12	Fine sandy loam	ML, SM, CL, SC, SC-SM, CL-ML	A-4	0	0	100	90-100	70-100	40-80	18-30	NP-5
	12-27	Clay loam	CL, SC, ML, SM	A-6, A-4	0	0-15	83-100	85-100	70-100	45-80	25-40	10-25
	27-41				---	---	---	---	---	---	---	---
	41-45	Unweathered bedrock			---	---	---	---	---	---	---	---
Hector---------	0-3	Fine sandy loam	CL-ML, ML, SC-SM, SM, CL, SC	A-4, A-2-4, A-2	0	0	80-100	75-100	70-100	35-75	15-25	NP-7
	3-8	Fine sandy loam	CL-ML, ML, SC-SM, SM, CL, SC	A-4, A-2-4, A-2	0	0	80-100	75-100	70-100	35-75	15-25	NP-7
	8-15	Fine sandy loam	ML, SM, SC, CL, CL-ML, SC-SM	A-1-b, A-2, A-4, A-2-4, A-1	0-5	0-5	55-100	55-100	35-100	20-65	15-25	NP-7
	15-19	Unweathered bedrock			---	---	---	---	---	---	---	---
Br:												
Brazilton------	0-15	Silty clay loam	CL, ML	A-6, A-7, A-7-5, A-7-6	0	0-5	95-100	90-100	85-100	70-95	35-50	15-25
	15-42	Silty clay	CH, CL, ML, MH	A-7, A-7-5, A-7-6	0	0-5	95-100	90-100	85-100	70-95	45-60	20-35
	42-60	Very channery silty clay loam, very gravelly silty clay loam	CH, CL, ML, MH	A-6, A-7, A-7-6, A-7-5	0	0-5	60-100	60-100	60-100	60-95	35-55	15-30
Cd:												
Catoosa--------	0-12	Silty clay loam	CL, ML	A-4, A-7-6, A-6, A-7-5, A-5	0	0	100	100	96-100	65-97	30-45	8-25
	12-38	Silty clay loam	CL, CH, ML, MH	A-6, A-7, A-7-5, A-7-6	0	0	100	100	85-100	70-98	33-60	12-40
	38-42	Unweathered bedrock			---	---	---	---	---	---	---	---
Ch:												
Cherokee-------	0-7	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0	100	100	90-100	80-95	20-35	5-15
	7-13	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0	100	100	90-100	80-95	20-35	5-15
	13-43	Clay	CH, CL, MH, ML	A-7, A-7-5, A-7-6	0	0	100	100	95-100	85-95	45-70	20-40
	43-60	Silty clay loam	CH, CL, ML, MH	A-6, A-7, A-7-5, A-7-6	0	0	100	100	95-100	85-95	35-70	15-40
De:												
Dennis---------	0-10	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0	100	100	96-100	65-97	20-37	1-15
	10-15	Silty clay loam	CL, ML	A-6, A-7, A-7-5, A-7-6	0	0	100	100	94-100	75-98	33-48	13-25
	15-28	Silty clay	CH, CL, ML, MH	A-7-5, A-7, A-7-6, A-6	0	0	100	100	94-100	75-98	37-65	15-40
	28-60	Silty clay	CH, CL, ML, MH	A-7-5, A-7, A-7-6, A-6	0	0	100	100	94-100	75-98	37-65	15-35
Ef:												
Eram-----------	0-8	Silty clay loam	CL, ML, MH, CH	A-6, A-7, A-7-5, A-7-6	0	0	100	100	85-100	70-95	33-55	12-30
	8-18	Clay	CH, CL, ML, MH	A-6, A-7, A-7-5, A-7-6	0	0	100	100	90-100	70-98	37-70	15-40
	18-26	Clay	CH, CL, ML, MH	A-6, A-7, A-7-5, A-7-6	0	0	100	100	90-100	70-98	37-70	15-40
	26-30	Weathered bedrock			---	---	---	---	---	---	---	---
Eh:												
Eram-----------	0-7	Silty clay loam	CL, ML, MH, CH	A-6, A-7, A-7-5, A-7-6	0	0	100	100	85-100	70-95	33-60	12-30
	7-28	Clay	CH, CL, ML, MH	A-6, A-7, A-7-5, A-7-6	0	0	100	100	90-100	70-98	37-70	15-40
	28-32	Weathered bedrock			---	---	---	---	---	---	---	---

ENGINEERING INDEX PROPERTIES--Continued
Labette County, Kansas

(Absence of an entry indicates that the data were not estimated.)

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
Eo:												
Eram----------	0-8	Silty clay loam	CL, ML, MH, CH	A-6, A-7, A-7-5, A-7-6	0	0	100	100	85-100	70-95	33-60	12-30
	8-28	Silty clay	CH, CL, ML, MH	A-6, A-7, A-7-6, A-7-5	0	0	100	100	90-100	80-98	37-85	15-50
	28-32	Weathered bedrock			---	---	---	---	---	---	---	---
Lebo----------	0-9	Silty clay loam	CL, ML	A-6, A-7-6, A-7-5, A-7	---	0	96-100	87-100	85-100	80-95	35-50	15-25
	9-15	Silty clay loam	CL, ML	A-6, A-7-6, A-7-5, A-7	---	0	96-100	87-100	85-100	80-95	35-50	15-25
	15-22	Channery silty clay loam	CL, ML	A-6, A-7-6, A-7-5, A-7	---	0	96-100	87-100	85-100	80-95	35-50	15-25
	22-32	Extremely channery silty clay loam	CL, ML	A-7-6, A-7-5, A-7, A-6, A-5, A-4	---	0	96-100	87-100	85-100	80-95	20-50	10-25
	32-36	Weathered bedrock			---	---	---	---	---	---	---	---
Es:												
Eram----------	0-7	Silty clay loam	CL, ML, MH, CH	A-6, A-7, A-7-6, A-7-5	0	0	100	100	85-100	70-95	33-60	12-30
	7-28	Clay	CH, CL, MH, ML	A-6, A-7, A-7-5, A-7-6	0	0	100	100	90-100	70-98	37-70	15-40
	28-32	Weathered bedrock			---	---	---	---	---	---	---	---
Nowata---------	0-8	Silt loam	CL, ML	A-4, A-6	---	0-15	75-100	80-100	75-95	70-95	30-37	8-15
	8-13	Gravelly silty clay loam	GC, SM, ML, GM, CL, SC	A-2, A-6, A-7, A-7-6, A-2-7, A-7-5, A-2-6, A-3, A-1-b, A-1-a, A-1	---	0-65	15-100	10-100	10-95	5-85	33-42	12-20
	13-36	Very channery silty clay loam	GC, SM, SC, GM, ML, CL	A-2, A-6, A-7, A-2-6, A-2-7, A-7-5, A-7-6, A-3, A-1-b, A-1-a, A-1	---	0-65	15-80	10-50	10-45	5-40	25-50	15-25
	36-40	Unweathered bedrock			---	---	---	---	---	---	---	---
He:												
Hepler---------	0-9	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0	100	100	90-100	75-100	20-35	2-15
	9-24	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0	100	100	90-100	75-100	20-35	2-20
	24-44	Silty clay loam	CL, ML	A-6, A-7, A-7-5, A-7-6	0	0	100	100	95-100	85-100	35-50	15-25
	44-60	Silty clay loam	CL, ML	A-6, A-7, A-7-5, A-7-6	0	0	100	100	95-100	85-100	35-50	15-30
HF:												
Hepler---------	0-10	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0	100	100	90-100	75-99	20-35	2-15
	10-30	Silt loam	CL-ML, ML, CL	A-4, A-6	0	0	100	100	90-100	75-99	20-35	2-15
	30-60	Silty clay loam	CL, ML	A-7-6, A-7-5, A-6, A-7	0	0	100	100	95-100	85-99	35-50	15-25
Ka:												
Kanima---------	0-6	Silty clay loam	CL, GC, SC, SM	A-7-6, A-7-5, A-7, A-6	---	0-50	50-100	48-100	40-100	40-100	33-48	12-30
	6-60	Very channery silty clay loam	GC, GP, ML, SC, SM, CL	A-1-b, A-4, A-7-6, A-2-4, A-2-5, A-2-6, A-7-5, A-7, A-6, A-5, A-2-7, A-3, A-1-a, A-1	---	0-90	10-100	7-100	5-100	5-100	30-45	8-30
Kb:												
Kanima---------	0-6	Silty clay loam	CL, GC, SC, SM	A-7-6, A-7-5, A-7, A-6	---	0-50	50-100	48-100	40-100	40-100	33-50	12-30
	6-60	Very channery silty clay loam	CL, GC, GP, SM, SC, ML	A-2, A-4, A-7-6, A-2-4, A-2-5, A-2-6, A-7-5, A-7, A-6, A-5, A-3, A-2-7, A-1-b, A-1-a, A-1	---	0-90	10-100	7-100	5-100	5-100	30-45	8-30
Ke:												
Kenoma---------	0-6	Silt loam	CL, CL-ML, ML	A-6, A-4	0	0	100	100	85-100	85-100	25-40	3-22
	6-13	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0	100	100	85-100	85-100	25-40	3-22
	13-26	Silty clay	CH, MH, CL	A-7, A-7-5, A-7-6	0	0-5	95-100	92-100	85-100	85-100	50-75	30-48
	26-49	Silty clay	CH, MH, CL	A-7, A-7-5, A-7-6	0	0-5	95-100	92-100	85-100	85-100	50-75	30-48
	49-60	Silty clay loam	CH, CL, MH	A-7-6, A-7-5, A-7	0	0-5	95-100	92-100	75-100	75-95	45-65	25-44

ENGINEERING INDEX PROPERTIES--Continued
Labette County, Kansas

(Absence of an entry indicates that the data were not estimated.)

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
Ln:												
Lanton	0-8	Silt loam	CL, ML	A-4, A-6	0	0	100	100	96-100	80-97	30-37	8-13
	8-37	Silty clay loam	CL, ML	A-6, A-7, A-7-6, A-7-5	0	0	100	100	98-100	90-98	33-42	12-25
	37-60	Silty clay loam	CH, CL, ML, MH	A-6, A-7, A-7-5, A-7-6	0	0	100	100	98-100	90-98	33-55	12-30
M-W:												
Miscellaneous Water	---	---	---	---	---	---	---	---	---	---	---	---
Od:												
Olpe	0-7	Silt loam	CL, ML, CL-ML	A-4, A-6	0	0	85-100	85-100	60-100	50-95	20-40	7-20
	7-13	Gravelly silt loam	CL, SM, SC-SM, SC, ML, CL-ML, GM, GC-GM, GC	A-4, A-6	0	0	50-100	40-100	50-100	40-95	20-40	7-20
	13-30	Very gravelly silty clay loam	GM, GC, SC, SM	A-2, A-6, A-7, A-1, A-2-6, A-2-7, A-7-5, A-7-6, A-1-b, A-1-a, A-3	0	0	10-65	10-50	10-45	10-40	25-55	15-30
	30-44	Very gravelly silty clay	GC, MH, ML, CL, GM, SM, SC, CH	A-2, A-7, A-2-7, A-1, A-7-5, A-7-6, A-1-b, A-2-6, A-6, A-1-a	0	0	20-70	10-60	10-55	10-50	25-65	20-40
	44-60	Silty clay	CH, CL, GC, SC, GM, SM, ML, MH	A-7, A-2-6, A-2, A-2-7, A-7-5, A-7-6, A-6	0	0	40-100	35-100	40-100	35-95	25-65	20-40
Dennis	0-10	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0	100	100	96-100	65-97	20-37	1-15
	10-15	Silty clay loam	CL, ML	A-6, A-7, A-7-5, A-7-6	0	0	100	100	94-100	75-98	33-48	13-25
	15-30	Silty clay	CH, CL, ML, MH	A-6, A-7, A-7-5, A-7-6	0	0	100	100	94-100	75-98	37-65	15-40
	30-60	Silty clay	CH, CL, ML, MH	A-6, A-7, A-7-5, A-7-6	0	0	100	100	94-100	75-98	37-65	15-40
Or:												
Orthents	0-17	Silty clay	CH, CL, ML, MH	A-7, A-6, A-7-5, A-7-6	0	0	100	100	95-100	90-100	35-60	15-35
	17-60	Silty clay	CH, CL, ML, MH	A-7, A-7-5, A-7-6	0	0	100	100	95-100	90-100	40-70	20-45
Os:												
Osage	0-12	Silty clay	CH, MH, CL	A-7, A-7-5, A-7-6	0	0	100	100	98-100	95-100	50-75	30-55
	12-17	Silty clay	CH, MH, CL	A-7, A-7-5, A-7-6	0	0	100	100	98-100	95-100	50-75	30-55
	17-30	Clay	CH, CL, ML, MH	A-7, A-7-5, A-7-6	0	0	100	100	98-100	95-100	40-80	20-50
	30-60	Clay	CH, CL, ML, MH	A-7, A-7-5, A-7-6	0	0	100	100	98-100	95-100	40-80	20-50
Pe:												
Parsons	0-8	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0	100	96-100	96-100	80-97	20-37	1-15
	8-13	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0	100	96-100	96-100	80-97	20-37	1-15
	13-36	Silty clay	CH, CL, ML, MH	A-6, A-7, A-7-5, A-7-6	0	0	100	96-100	96-100	80-99	37-70	15-40
	36-60	Silty clay	CH, CL, ML, MH	A-6, A-7, A-7-5, A-7-6	0	0	100	96-100	96-100	80-99	37-70	15-40
Pt:												
Pits, Quarries	0-60	Variable			---	---	---	---	---	---	---	---
Sd:												
Shidler	0-12	Silt loam	CL, ML	A-4, A-6	---	0-25	75-100	63-100	70-100	60-97	30-37	8-13
	12-16	Unweathered bedrock			---	---	---	---	---	---	---	---
Catoosa	0-12	Silty clay loam	CL, ML	A-4, A-7-6, A-7-5, A-7, A-6, A-5	0	0	100	100	96-100	65-97	30-50	8-30
	12-38	Clay	CL, CH, ML, MH	A-6, A-7, A-7-5, A-7-6	0	0	100	100	85-100	70-98	33-65	12-40
	38-42	Unweathered bedrock			---	---	---	---	---	---	---	---
Vc:												
Verdigris	0-11	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0	100	100	95-100	65-100	20-38	2-23
	11-34	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0	100	100	95-100	65-100	20-35	2-23
	34-43	Silt loam	CL, ML	A-4, A-6, A-7, A-7-6, A-5, A-7-5	0	0	100	100	95-100	80-100	30-45	8-23
	43-60	Silty clay loam	CL, ML	A-4, A-6, A-7, A-5, A-7-5, A-7-6	0	0	100	100	95-100	80-100	30-45	8-23
Vf:												
Verdigris	0-34	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0	100	100	95-100	65-100	22-40	2-15
	34-60	Silt loam	CL, ML	A-4, A-6, A-7, A-5, A-7-5, A-7-6	0	0	100	100	95-100	80-100	30-45	8-23
W:												
Water	---	---	---	---	---	---	---	---	---	---	---	---

ENGINEERING INDEX PROPERTIES--Continued
Labette County, Kansas

(Absence of an entry indicates that the data were not estimated.)

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
Zb:												
Zaar----------	0-7	Silty clay	CH, MH, CL	A-7, A-7-6, A-7-5	0	0	100	100	95-100	90-100	50-70	25-40
	7-17	Silty clay	CH, MH, CL	A-7, A-7-6, A-7-5	0	0	100	100	95-100	90-100	50-70	25-40
	17-54	Silty clay	CH, MH, CL	A-7, A-7-6, A-7-5	0	0-10	90-100	85-100	95-100	90-100	50-70	25-40
	54-60	Silty clay	CH, CL, ML, MH	A-7, A-7-5, A-7-6, A-6	0	0-10	90-100	85-100	95-100	90-100	40-65	15-40

PHYSICAL PROPERTIES OF THE SOILS
Labette County, Kansas

Physical Properties table shows estimates of some physical characteristics and features that affect soil behavior. These estimates are given for the layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Depth to the upper and lower boundaries of each layer is indicated.

Particle size is the effective diameter of a soil particle as measured by sedimentation, sieving, or micrometric methods. Particle sizes are expressed as classes with specific effective diameter class limits. The broad classes are sand, silt, and clay, ranging from the larger to the smaller.

Sand as a soil separate consists of mineral soil particles that are 0.05 millimeter to 2 millimeters in diameter. In this table, the estimated sand content of each soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

Silt as a soil separate consists of mineral soil particles that are 0.002 to 0.05 millimeter in diameter. In this table, the estimated silt content of each soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

Clay as a soil separate consists of mineral soil particles that are less than 0.002 millimeter in diameter. In this table, the estimated clay content of each soil layer is given as a percentage, by weight, of the soil soil material that is less than 2 millimeters in diameter.

The content of sand, silt, and clay affects the physical behavior of a soil. Particle size is important for engineering and agronomic interpretations, for determination of soil hydrologic qualities, and for soil classification.

The amount and kind of clay affect the fertility and physical condition of the soil and the ability of the soil to adsorb cations and to retain moisture. They influence shrink–swell potential, permeability, plasticity, the ease of soil dispersion, and other soil properties. The amount and kind of clay in a soil also affect tillage and earth moving operations.

Moist bulk density is the weight of soil (ovendry) per unit volume. Volume is measured when the soil is at field moisture capacity, that is, the moisture content at 1/3– or 1/10–bar (33kPa or 10kPa) moisture tension. Weight is determined after the soil is dried at 105 degrees C. In the table,the estimated moist bulk density of each soil horizon is expressed in grams per cubic centimeter of soil material that is less than 2 millimeters in diameter. Bulk density data are used to compute shrink–swell potential, available water capacity, total pore space, and other soil properties. The moist bulk density of a soil indicates the pore space available for water and roots. Depending on soil texture, a bulk density of more than 1.4 can restrict water storage and root penetration. Moist bulk density is influenced by texture, kind of clay, content of organic matter, and soil structure.

Permeability (K<–>sat) refers to the ability of a soil to transmit water or air. The term "permeability," as used in soil surveys, indicates saturated hydraulic conductivity (K<–>sat). The estimates in the table indicate the rate of water movement, in inches per hour, when the soil is saturated. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Permeability is considered in the design of soil drainage systems and septic tank absorption fields.

Available water capacity refers to the quantity of water that the soil is capable of storing for use by plants. The capacity for water storage is given in inches of water per inch of soil for each soil layer. The capacity varies, depending on soil properties that affect retention of water. The most important properties are the content of organic matter, soil texture, bulk density, and soil structure. Available water capacity is an important factor in the choice of plants or crops to be grown and in the design and management of irrigation systems. Available water capacity is not an estimate of the quantity of water actually available to plants at any given time.

Linear extensibility refers to the change in length of an unconfined clod as moisture content is decreased from a moist to a dry state. It is an expression of the volume change between the water content of the clod at 1/3– or 1/10–bar tension (33kPa or 10kPa tension) and oven dryness. The volume change is reported in the table as percent change for the whole soil. Volume change is influenced by the amount and type of clay minerals in the soil.

Linear extensibility is used to determine the shrink–swell potential of soils. The shrink–swell potential is low if the soil has a linear extensibility of less than 3 percent; moderate if 3 to 6 percent; high if 6 to 9 percent; and very high if more than 9 percent. If the linear extensibility is more than 3, shrinking and swelling can cause damage to buildings, roads, and other structures and to plant roots. Special design commonly is needed.

Organic matter is the plant and animal residue in the soil at various stages of decomposition. In Physical Properties table, the estimated content of organic matter is expressed as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter. The content of organic matter in a soil can be maintained by returning crop residue to the soil. Organic matter has a positive effect on available water capacity, water infiltration, soil organism activity, and tilth. It is a source of nitrogen and other nutrients for crops and soil organisms.

Erosion factors are shown in the Physical Properties table as the K factor (Kw and Kf) and the T factor. Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) and the Revised Universal Soil Loss Equation (RUSLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, sand, and organic matter and on soil structure and permeability. Values of K range from 0.02 to 0.69. Other factors being equal, the higher the value, the more susceptible the soil is to sheet and rill erosion by water.

Erosion factor Kw indicates the erodibility of the whole soil. The estimates are modified by the presence of rock fragments.

Erosion factor Kf indicates the erodibility of the fine–earth fraction, or the material less than 2 millimeters in size.

Erosion factor T is an estimate of the maximum average annual rate of soil erosion by wind or water that can occur without affecting crop productivity over a sustained period. The rate is in tons per acre per year.

Wind erodibility groups are made up of soils that have similar properties affecting their susceptibility to

PHYSICAL PROPERTIES OF THE SOILS--Continued
Labette County,
Kansas

wind erosion in cultivated areas. The soils assigned to group 1 are the most susceptible to wind erosion, and those assigned to group 8 are the least susceptible. The groups are as follows:

1. Coarse sands, sands, fine sands, and very fine sands.

2. Loamy coarse sands, loamy sands, loamy fine sands, loamy very fine sands, ash material, and sapric soil material.

3. Coarse sandy loams, sandy loams, fine sandy loams, and very fine sandy loams.

4L. Calcareous loams, silt loams, clay loams, and silty clay loams.

4. Clays, silty clays, noncalcareous clay loams, and silty clay loams that are more than 35 percent clay.

5. Noncalcareous loams and silt loams that are less than 20 percent clay and sandy clay loams, sandy clays, and hemic soil material.

6. Noncalcareous loams and silt loams that are more than 20 percent clay and noncalcareous clay loams that are less than 35 percent clay.

7. Silts, noncalcareous silty clay loams that are less than 35 percent clay, and fibric soil material.

8. Soils that are not subject to wind erosion because of coarse fragments on the surface or because of surface wetness.

Wind erodibility index is a numerical value indicating the susceptibility of soil to wind erosion, or the tons per acre per year that can be expected to be lost to wind erosion. There is a close correlation between wind erosion and the texture of the surface layer, the size and durability of surface clods, rock fragments, organic matter, and a calcareous reaction. Soil moisture and forzen soil layers also influence wind erosion.

Explanation of Wind Erodibility Groups

Soil erodibility by wind is directly related to the percentage of dry non-erodible surface soil aggregates larger than 0.84 mm in diameter. From this percentage, the wind erodibility index (I-factor) is determined. The I-factor is an expression of the stability of these soil aggregates against breakdown by tillage and abrasion from wind erosion. Soils are placed in Wind Erodibility Groups (WEG) having similar percentages of dry soil aggregates larger than 0.84 mm as shown in the following table.

WEG	Properties of Soil Surface Layer	Dry Soil Aggregates >0.84mm Percent	Wind Erodibilty Index T/Ac/Yr (I)
1	Very fine sand, fine sand, sand, or coarse sand	1	310 1/
		2	250
		3	220
		5	180
		7	160
2	Loamy very fine sand, loamy fine sand, loamy sand, loamy coarse sand, organic soil materials.	10	134
3	Very fine sandy loam, fine sandy loam, sandy loam, or coarse sandy loam.	25	86
4	Clay, silty clay, non-calcareous clay loam, or silty clay loam with >35 percent clay content.	25	86
4L	Calcareous 2/ loam, silt loam, clay loam, or silty clay loam.	25	86
5	Non-calcareous loam and silt loam with <20 percent clay content, or sandy clay loam, sandy clay, and hemic 3/ organic soil materials.	40	56
6	Non-calcareous loam and silt loam with >20 percent clay content, or non-calcareous clay loam with <35 percent clay content.	45	48
7	Silt, non-calcareous silty clay loam with >35 percent clay content and fibric 3/ organic soil material.	50	38
8	Soils not suitable for cultivation due to coarse fragments or wetness; wind erosion is not a problem.	--	0

1/ The "I" values for WEG 1 vary from 160 for coarse sands to 310 for very fine sands. Use an "I" of 220 as an average figure. For coarser sand that has gravel, use a lower figure. For a soil that has no gravel and very fine sand, use a higher figure. (Modification for coarse fragments is preparation.)

2/ Calcareous is a strongly or violently effervescent reaction to cold dilute (1N) HCL.

3/ See Soil Taxonomy for definition.

PHYSICAL PROPERTIES OF THE SOILS--Continued
Labette County, Kansas: Published

(Single entries under "Sand and Silt" are a representative percentage are calculated using an algorithm. Entries under "Erosion factors--T" apply to the entire profile. Entries under "Wind erodibility group" and "Wind erodibility index" apply only to the surface layer)

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Linear extensibility	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index
										K	Kf	T		
	In	Pct	Pct	Pct	g/cc	in/hr	In/in	Pct	Pct					
021ES:														
Eram----------	0-8	10	52	27-40	1.30-1.60	0.06-0.20	0.15-0.20	2.0-8.9	1.0-3.0	.37	.37	3	7	38
	8-26	8	38	35-55	1.35-1.65	0.06-0.20	0.12-0.18	2.0-8.9	0.0-2.0	.37	.37			
	26-30	---	---	---	---	0.00-0.20	---	---	---	---	---			
Shidler------	0-12	20	49	27-35	1.30-1.60	0.20-0.60	0.18-0.22	3.0-5.9	1.0-5.0	.32	.32	1	4L	86
	12-16	---	---	---	---	---	---	---	---	---	---			
125BF:														
Bates---------	0-9	44	37	15-27	1.40-1.50	0.60-2.00	0.20-0.24	0.0-2.9	1.0-4.0	.32	.32	3	5	56
	9-15	41	35	18-35	1.40-1.60	0.60-2.00	0.15-0.19	0.0-2.9	1.0-3.0	.28	.32			
	15-31	39	25	18-40	1.40-1.50	0.20-0.60	0.14-0.16	0.0-3.2	0.5-1.0	.20	.43			
	31-35	---	---	---	---	0.20-0.60	---	---	---	---	---			
Collinsville-	0-11	67	20	5-20	1.30-1.60	2.00-6.00	0.09-0.15	0.0-2.9	1.0-3.0	.20	.20	1	3	86
	11-17	67	20	5-20	1.40-1.70	2.00-6.00	0.07-0.20	0.0-2.9	0.5-2.0	.20	.20			
	17-21	---	---	---	---	---	---	---	---	---	---			
Ae:														
Apperson-----	0-7	4	67	27-35	1.20-1.60	0.20-0.60	0.16-0.20	3.0-5.9	1.0-3.0	.37	.37	3	7	38
	7-13	4	59	27-40	1.25-1.60	0.20-0.60	0.16-0.20	3.0-8.9	1.0-3.0	.37	.37			
	13-24	3	54	35-45	1.25-1.70	0.20-0.60	0.14-0.20	6.0-10.5	0.5-2.0	.37	.37			
	24-49	8	46	40-60	1.25-1.60	0.06-0.20	0.14-0.18	6.0-10.5	0.0-1.0	.32	.32			
	49-53	---	---	---	---	---	---	---	---	---	---			
AED:														
Arents, Earthen Dam-	---			---	---	---	---	---	---	---	---	-	---	---
Be:														
Bates---------	0-9	44	37	15-27	1.40-1.50	0.60-2.00	0.15-0.22	0.0-2.9	1.0-5.0	.32	.32	3	5	48
	9-16	41	35	15-27	1.40-1.50	0.60-2.00	0.15-0.24	0.0-2.9	1.0-3.0	.32	.32			
	16-30	39	25	18-40	1.40-1.60	0.20-0.57	0.12-0.19	0.0-3.5	0.2-1.5	.28	.32			
	30-34	---	---	---	---	0.20-0.57	---	---	---	---	---			
Bf:														
Bates---------	0-7	44	37	15-27	1.40-1.50	0.60-2.00	0.15-0.22	0.0-2.9	1.0-5.0	.32	.32	3	5	48
	7-12	41	35	15-27	1.40-1.50	0.60-2.00	0.15-0.22	0.0-2.9	1.0-3.0	.32	.32			
	12-26	39	25	18-40	1.40-1.60	0.20-0.57	0.13-0.19	0.0-3.5	0.5-1.5	.28	.32			
	26-30	---	---	---	---	0.20-0.57	---	---	---	---	---			
Bm:														
Bates---------	0-8	44	37	15-27	1.40-1.50	0.60-2.00	0.15-0.22	0.0-2.9	1.0-5.0	.32	.32	3	5	48
	8-12	41	35	15-27	1.40-1.50	0.60-2.00	0.15-0.22	0.0-2.9	1.0-3.0	.32	.32			
	12-27	39	25	18-40	1.40-1.60	0.20-0.57	0.13-0.19	0.0-3.5	0.5-1.5	.28	.32			
	27-31	---	---	---	---	0.20-0.57	---	---	---	---	---			
Collinsville-	0-8	67	20	5-20	1.30-1.60	2.00-6.00	0.09-0.15	0.0-2.9	1.0-3.0	.20	.20	1	3	86
	8-13	67	20	5-20	1.40-1.70	2.00-6.00	0.07-0.20	0.0-2.9	0.5-2.0	.20	.20			
	13-17	---	---	---	---	---	---	---	---	---	---			
Bo:														
Bolivar------	0-5	58	35	5-18	1.20-1.45	2.00-6.00	0.05-0.18	0.0-2.9	0.5-2.0	.24	.24	3	3	86
	5-12	52	40	5-18	1.20-1.45	2.00-6.00	0.10-0.18	0.0-2.9	0.5-1.0	.28	.24			
	12-27	44	24	20-35	1.30-1.50	0.60-2.00	0.08-0.16	3.0-5.9	0.1-1.0	.32	.32			
	27-41	---	---	---	---	0.20-0.57	---	---	---	---	---			
	41-45	---	---	---	---	---	---	---	---	---	---			
Hector-------	0-3	68	24	5-20	1.30-1.60	2.00-6.00	0.08-0.14	0.0-2.9	0.5-2.0	.24	.24	1	3	86
	3-8	68	24	5-20	1.30-1.70	2.00-6.00	0.08-0.14	0.0-2.9	0.5-1.5	.28	.28			
	8-15	68	22	10-25	1.30-1.60	2.00-6.00	0.08-0.15	0.0-2.9	0.5-0.5	.17	.17			
	15-19	---	---	---	---	---	---	---	---	---	---			
Br:														
Brazilton----	0-15	13	52	28-40	1.40-1.60	0.06-0.20	0.08-0.18	3.0-5.9	1.0-4.0	.37	.37	5	7	38
	15-42	20	40	35-55	1.50-1.70	0.00-0.06	0.05-0.15	5.5-8.9	0.5-3.0	.37	.37			
	42-60	6	60	28-45	1.45-1.65	0.60-2.00	0.05-0.18	2.5-5.9	0.1-2.0	.32	.32			
Cd:														
Catoosa------	0-12	7	56	15-40	1.30-1.55	0.60-2.00	0.15-0.24	0.0-4.5	1.0-4.0	.37	.37	2	6	48
	12-38	8	38	27-60	1.20-1.60	0.20-0.60	0.12-0.22	3.0-7.9	0.5-2.5	.32	.32			
	38-42	---	---	---	---	---	---	---	---	---	---			
Ch:														
Cherokee-----	0-7	7	76	10-27	1.25-1.40	0.60-2.00	0.15-0.24	0.0-2.9	0.5-2.0	.49	.49	3	5	48
	7-13	14	66	10-27	1.25-1.35	0.60-2.00	0.15-0.24	0.0-2.9	0.5-1.2	.49	.49			
	13-43	38	38	40-60	1.20-1.50	0.20-0.60	0.10-0.15	6.0-11.0	0.5-1.0	.32	.32			
	43-60	15	43	35-50	1.35-1.90	0.00-0.06	0.09-0.18	2.5-8.9	0.0-0.5	.32	.32			
De:														
Dennis-------	0-10	18	66	10-27	1.30-1.55	0.60-2.00	0.15-0.20	0.0-5.9	1.0-4.0	.43	.43	5	6	48
	10-15	13	57	27-35	1.30-1.70	0.20-0.60	0.15-0.20	3.0-5.9	0.5-2.0	.37	.37			
	15-28	7	42	35-55	1.20-1.65	0.06-0.20	0.12-0.20	6.0-9.8	0.0-1.5	.37	.37			
	28-60	13	45	35-55	1.30-1.65	0.06-0.20	0.12-0.20	6.0-8.9	0.0-1.0	.37	.37			
Ef:														
Eram----------	0-8	10	56	27-40	1.30-1.60	0.20-0.60	0.12-0.20	3.0-5.9	1.0-4.0	.37	.37	3	7	38
	8-18	26	29	35-55	1.35-1.65	0.06-0.20	0.10-0.18	6.0-8.9	0.5-2.0	.37	.37			
	18-26	26	29	35-55	1.35-1.65	0.06-0.20	0.10-0.18	6.0-8.9	0.5-2.0	.37	.37			
	26-30	---	---	---	---	0.00-0.20	---	---	---	---	---			
Eh:														
Eram----------	0-7	19	48	27-40	1.30-1.60	0.20-0.60	0.12-0.20	3.0-5.9	1.0-3.0	.37	.37	3	7	38
	7-28	26	29	35-55	1.35-1.65	0.06-0.20	0.10-0.18	6.0-8.9	0.5-2.0	.37	.37			
	28-32	---	---	---	---	0.00-0.20	---	---	---	---	---			

PHYSICAL PROPERTIES OF THE SOILS--Continued
Labette County, Kansas: Published

(Single entries under "Sand and Silt" are a representative percentage are calculated using an algorithm. Entries under "Erosion factors--T" apply to the entire profile. Entries under "Wind erodibility group" and "Wind erodibility index" apply only to the surface layer)

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Linear extensibility	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index
										K	Kf	T		
	In	Pct	Pct	Pct	g/cc	in/hr	In/in	Pct	Pct					
Eo:														
Eram----------	0-8	19	48	27-40	1.30-1.60	0.20-0.60	0.12-0.20	3.0-5.9	1.0-3.0	.37	.37	3	7	38
	8-28	7	48	35-55	1.35-1.65	0.06-0.20	0.10-0.18	6.0-8.9	0.5-2.0	.37	.37			
	28-32	---	---	---	---	0.00-0.20	---	---	---	---	---			
Lebo----------	0-9	19	52	22-35	1.35-1.45	0.60-2.00	0.12-0.23	3.0-5.9	1.0-3.0	.32	.32	3	7	38
	9-15	19	52	22-35	1.35-1.45	0.60-2.00	0.12-0.23	3.0-5.9	1.0-3.0	.32	.32			
	15-22	19	52	22-35	1.40-1.50	0.60-2.00	0.12-0.18	3.0-5.9	0.5-2.0	.24	.24			
	22-32	19	52	22-35	1.45-1.65	0.60-2.00	0.07-0.10	0.5-5.9	0.0-1.0	.24	.24			
	32-36			---	---	0.00-0.20	0.00-0.00	---	---	---	---			
Es:														
Eram----------	0-7	19	48	27-40	1.30-1.60	0.20-0.60	0.12-0.20	3.0-5.9	1.0-3.0	.37	.37	3	7	38
	7-28	26	29	35-55	1.35-1.65	0.06-0.20	0.10-0.18	6.0-8.9	0.5-2.0	.37	.37			
	28-32	---	---	---	---	0.00-0.20	---	---	---	---	---			
Nowata--------	0-8	26	53	15-27	1.30-1.50	0.60-2.00	0.15-0.22	0.0-2.9	1.0-3.0	.37	.37	2	6	48
	8-13	20	49	27-35	1.45-1.75	0.20-0.60	0.08-0.12	3.0-5.9	0.5-2.0	.32	.37			
	13-36	20	49	27-35	1.45-1.75	0.20-0.60	0.08-0.12	2.5-5.9	0.0-1.0	.32	.37			
	36-40			---	---	0.00-0.57	---	---	---	---	---			
He:														
Hepler--------	0-9	3	78	12-27	1.25-1.50	0.60-2.00	0.22-0.24	0.0-2.9	0.5-2.0	.37	.37	5	6	48
	9-24	4	71	12-27	1.25-1.50	0.60-2.00	0.22-0.24	0.0-2.9	0.5-1.0	.37	.37			
	24-44	4	64	27-35	1.35-1.60	0.60-2.00	0.18-0.20	3.0-5.9	0.0-1.0	.37	.37			
	44-60	2	66	27-42	1.35-1.60	0.20-0.60	0.14-0.17	3.0-5.9	0.0-0.5	.37	.37			
HF:														
Hepler--------	0-10	7	79	12-27	1.25-1.35	0.60-2.00	0.22-0.24	0.0-2.9	0.5-1.0	.37	.37	5	6	48
	10-30	6	77	12-27	1.25-1.35	0.60-2.00	0.22-0.24	0.0-2.9	0.5-1.0	.37	.37			
	30-60	3	70	27-35	1.35-1.45	0.20-0.60	0.18-0.20	3.0-5.9	0.0-0.5	.37	.37			
Ka:														
Kanima--------	0-6	11	50	27-50	1.30-1.60	0.60-2.00	0.08-0.17	0.0-3.5	0.5-2.0	.28	.32	5	7	38
	6-60	9	56	18-70	1.40-1.90	0.60-2.00	0.02-0.12	0.0-2.9	0.0-1.0	.15	.28			
Kb:														
Kanima--------	0-6	11	50	27-50	1.30-1.60	0.60-2.00	0.08-0.17	0.0-3.5	0.5-2.0	.28	.32	5	7	38
	6-60	9	56	18-70	1.40-1.90	0.60-2.00	0.02-0.12	0.0-2.9	0.0-1.0	.15	.32			
Ke:														
Kenoma--------	0-6	4	70	18-27	1.35-1.45	0.20-0.60	0.22-0.24	0.0-4.0	2.0-4.0	.43	.43	3	6	48
	6-13	4	70	18-27	1.35-1.45	0.20-0.60	0.22-0.24	0.0-4.0	2.0-4.0	.43	.43			
	13-26	3	48	40-60	1.35-1.50	0.06-0.20	0.10-0.20	6.0-8.9	0.5-1.0	.32	.32			
	26-49	3	51	40-60	1.30-1.50	0.06-0.20	0.10-0.15	6.0-10.0	0.5-1.0	.32	.32			
	49-60	6	55	30-50	1.30-1.60	0.00-0.06	0.10-0.20	2.5-8.9	0.0-0.5	.32	.32			
Ln:														
Lanton--------	0-8	6	73	18-27	1.30-1.50	0.60-2.00	0.18-0.22	0.0-2.9	1.0-5.0	.37	.37	5	6	86
	8-37	4	66	27-35	1.35-1.70	0.20-0.60	0.18-0.22	3.0-5.9	1.0-3.0	.37	.37			
	37-60	5	66	27-45	1.35-1.65	0.06-0.20	0.12-0.18	3.0-5.9	0.0-1.0	.37	.37			
M-W:														
Miscellaneous Water-------	---			---	---	---	---	---	---	---	---	-	---	---
Od:														
Olpe----------	0-7	25	53	15-30	1.25-1.35	0.60-2.00	0.15-0.20	0.0-2.9	1.0-2.0	.43	.43	5	6	48
	7-13	25	53	15-30	1.25-1.35	0.60-2.00	0.09-0.12	0.0-2.9	1.0-2.0	.43	.43			
	13-30	19	48	27-40	1.30-1.40	0.20-0.60	0.02-0.04	3.0-9.0	0.5-2.0	.24	.64			
	30-44	8	50	35-50	1.35-1.45	0.06-0.20	0.01-0.03	3.0-7.0	0.0-1.0	.24	.64			
	44-60	8	50	35-50	1.40-1.55	0.06-0.20	0.05-0.08	6.0-8.9	0.0-0.5	.24	.32			
Dennis--------	0-10	18	66	10-27	1.30-1.55	0.60-2.00	0.15-0.20	0.0-3.9	1.0-3.0	.43	.43	5	6	48
	10-15	12	58	27-35	1.35-1.70	0.20-0.60	0.15-0.20	3.0-5.9	0.5-2.0	.37	.37			
	15-30	7	42	35-55	1.25-1.65	0.06-0.20	0.15-0.20	6.0-9.8	0.0-1.0	.37	.37			
	30-60	13	45	35-55	1.35-1.65	0.06-0.20	0.12-0.20	6.0-8.9	0.0-1.0	.37	.37			
Or:														
Orthents------	0-17	8	53	27-50	1.35-2.20	0.00-0.06	0.03-0.12	4.0-8.9	0.0-1.0	.32	.32	5	4	86
	17-60	6	47	35-60	1.35-1.45	0.06-0.20	0.09-0.12	6.0-8.9	0.0-1.0	.32	.32			
Os:														
Osage---------	0-12	1	43	40-65	1.20-1.60	0.20-0.60	0.10-0.16	9.0-25.0	1.0-4.0	.28	.28	5	4	86
	12-17	1	44	40-75	1.20-1.60	0.20-0.60	0.10-0.18	9.0-25.0	1.0-4.0	.28	.28			
	17-30	1	36	35-75	1.20-1.70	0.06-0.60	0.08-0.18	9.0-25.0	0.5-2.0	.28	.28			
	30-60	0	38	35-75	1.20-1.70	0.00-0.06	0.08-0.18	9.0-25.0	0.5-2.0	.28	.28			
Pe:														
Parsons------	0-8	6	77	15-25	1.30-1.50	0.60-2.00	0.16-0.24	0.0-2.9	0.5-2.0	.49	.49	3	5	48
	8-13	6	76	15-25	1.30-1.50	0.60-2.00	0.16-0.24	0.0-2.9	0.5-1.5	.49	.49			
	13-36	3	46	35-60	1.40-1.70	0.20-0.60	0.10-0.18	6.0-8.9	0.0-0.5	.43	.43			
	36-60	14	46	30-60	1.40-1.70	0.06-0.20	0.10-0.18	6.0-8.9	0.0-0.5	.43	.43			
Pt:														
Pits, Quarries----	0-60			---	---	---	---	---	---	---	---	-	---	0
Sd:														
Shidler------	0-12	26	52	18-26	1.30-1.50	0.60-2.00	0.16-0.24	0.0-2.9	1.0-5.0	.32	.37	1	4L	48
	12-16			---	---	---	---	---	---	---	---			
Catoosa------	0-12	7	56	15-40	1.30-1.55	0.60-2.00	0.15-0.24	0.0-5.0	1.0-4.0	.37	.37	2	6	48
	12-38	8	38	27-60	1.20-1.60	0.20-0.60	0.12-0.22	3.0-8.0	0.5-2.5	.32	.32			
	38-42			---	---	---	---	---	---	---	---			
Vc:														
Verdigris-----	0-11	14	63	15-27	1.30-1.65	0.60-2.00	0.15-0.24	0.0-2.9	2.0-4.0	.32	.32	5	6	48
	11-34	20	56	15-27	1.30-1.65	0.60-2.00	0.15-0.24	0.0-2.9	2.0-4.0	.32	.32			
	34-43	15	59	18-35	1.40-1.65	0.60-2.00	0.12-0.22	1.0-5.9	0.0-2.0	.32	.32			
	43-60	12	57	18-35	1.40-1.65	0.60-2.00	0.12-0.22	3.0-5.9	0.0-2.0	.32	.32			

PHYSICAL PROPERTIES OF THE SOILS--Continued
Labette County, Kansas: Published

(Single entries under "Sand and Silt" are a representative percentage are calculated using an algorithm. Entries under "Erosion factors--T" apply to the entire profile. Entries under "Wind erodibility group" and "Wind erodibility index" apply only to the surface layer)

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Linear extensibility	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index
										K	Kf	T		
	In	Pct	Pct	Pct	g/cc	in/hr	In/in	Pct	Pct					
Vf:														
Verdigris----	0-34	14	63	15-27	1.30-1.60	0.60-2.00	0.20-0.24	0.0-2.9	2.0-4.0	.32	.32	5	6	48
	34-60	15	59	18-35	1.40-1.65	0.60-2.00	0.17-0.22	0.0-5.9	0.0-2.0	.32	.32			
W:														
Water---------	---			---	---	---	---	---	---	---	---	-	---	---
Zb:														
Zaar----------	0-7	5	53	40-60	1.20-1.30	0.20-0.60	0.12-0.18	6.0-12.0	2.0-4.0	.28	.28	5	4	86
	7-17	5	52	40-60	1.20-1.50	0.20-0.60	0.12-0.18	6.0-8.9	1.5-3.0	.28	.28			
	17-54	5	47	40-60	1.35-1.50	0.06-0.20	0.11-0.18	6.0-8.9	0.5-2.0	.28	.28			
	54-60	9	42	35-50	1.35-1.50	0.00-0.06	0.10-0.18	6.0-8.9	0.0-2.0	.28	.28			

CHEMICAL PROPERTIES OF THE SOILS
Labette County, Kansas

The Chemical Properties table shows estimates of some characteristics and features that affect soil behavior. These estimates are given for the major layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils. Depth to the upper and lower boundaries of each layer is indicated.

Cation−exchange capacity is the total amount of extractable bases that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. Soils having a low cation−exchange capacity hold fewer cations and may require more frequent applications of fertilizer than soils having a high cation−exchange capacity. Soils having a high cation−exchange capacity can retain cations. The ability to retain cations helps to prevent the pollution of ground water.

Effective cation−exchange capacity refers to the sum of extractable bases plus aluminum expressed in terms of milliequivalents per 100 grams of soil. It is determined for soils that have pH of less than 5.5.

Soil reaction is a measure of acidity or alkalinity and is expressed as a range in pH values. The range in pH of each major horizon is based on many field tests. For many soils, values have been verified by laboratory analyses. Soil reaction is important in selecting crops and other plants, in evaluating soil amendments for fertility and stabilization, and in determining the risk of corrosion.

Calcium carbonate equivalent is the percent of carbonates, by weight, in the fraction of the soil less than 2 millimeters in size. The availability of plant nutrients is influenced by the amount of carbonates in the soil. Incorporating nitrogen fertilizer into calcareous soils helps to prevent nitrite accumulation and ammonium−N volatilization.

Gypsum is expressed as a percent, by weight, of hydrated calcium sulfates in the fraction of the soil less than 20 millimeters in size. Gypsum is partially soluble in water and can be dissolved and removed by water. Soils that have a high content of gypsum may collapse if the gypsum is removed by percolating water.

Salinity is a measure of soluble salts in the soil at saturation. It is expressed as the electrical conductivity of the saturation extract, in millimhos per centimeter at 25 degrees C. Estimates are based on field and laboratory measurements at representative sites of nonirrigated soils. The salinity of irrigated soils is affected by the quality of the irrigation water and by the frequency of water application. Hence, the salinity of soils in individual fields can differ greatly from the value given in the table. Salinity affects the suitability of a soil for crop production, the stability of soil if used as construction material, and the potential of the soil to corrode metal and concrete.

Sodium adsorption ratio (SAR) is a measure of the amount of sodium (Na) relative to calcium (Ca) and magnesium (Mg) in the water extract from saturated soil paste. It is the ratio of the Na concentration divided by the square root of one−half of the Ca + Mg concentration. Soils that have SAR values of 13 or more may be characterized by an increased dispersion of organic matter and clay particles, reduced permeability and aeration, and a general degradation of soil structure.

CHEMICAL PROPERTIES OF THE SOILS--Continued
Labette County, Kansas

Map symbol and soil name	Depth	Cation-exchange capacity	Effective Cation Exchange Capacity	Soil reaction	Calcium carbonate	Gypsum	Salinity	Sodium adsorption ratio
	In	meq/100g	pH	Pct	Pct	mmhos/cm		
021ES:								
Eram----------	0-8	13-30	---	5.6-6.5	---	---	---	---
	8-26	14-37	---	5.1-7.3	---	---	---	---
	26-30	---	---	---	---	---	---	---
Shidler----------	0-12	13-31	---	6.1-8.4	---	---	---	---
	12-16	---	---	---	---	---	---	---
125BF:								
Bates----------	0-9	8.0-24	---	5.1-6.5	0	0	0	0
	9-15	9.0-27	---	5.1-6.5	0	0	0	0
	15-31	8.0-26	---	5.1-6.5	0	---	0	0
	31-35	---	---	---	---	---	---	---
Collinsville----	0-11	4.0-18	---	4.5-6.5	0	0	0	0
	11-17	3.0-16	---	4.5-6.5	0	0	0	0
	17-21	---	---	---	---	---	---	---
Ae:								
Apperson--------	0-7	13-27	---	5.6-6.5	---	---	---	---
	7-13	13-30	---	5.6-6.5	---	---	---	---
	13-24	15-31	---	5.6-7.8	---	---	---	---
	24-49	16-38	---	6.1-8.4	---	---	---	---
	49-53	---	0.0-0.0	---	---	---	---	---
AED:								
Arents, Earthen Dam----------	---	---	---	---	---	---	---	---
Be:								
Bates----------	0-9	8.0-22	---	5.1-6.5	0	0	0	0
	9-16	---	---	5.1-6.5	0	0	0	0
	16-30	8.0-27	---	5.1-6.5	0	0	0	0
	30-34	---	---	---	---	---	---	---
Bf:								
Bates----------	0-7	8.0-26	---	5.1-6.5	0	0	0	0
	7-12	---	---	5.1-6.5	0	0	0	0
	12-26	8.0-27	---	5.1-6.5	0	0	0	0
	26-30	---	---	---	---	---	---	---
Bm:								
Bates----------	0-8	8.0-26	---	5.1-6.5	0	0	0	0
	8-12	---	---	5.1-6.5	0	0	0	0
	12-27	8.0-27	---	5.1-6.5	0	0	0	0
	27-31	---	---	---	---	---	---	---
Collinsville----	0-8	4.0-18	---	4.5-6.5	---	---	---	---
	8-13	3.0-16	---	4.5-6.5	---	---	---	---
	13-17	---	0.0-0.0	---	---	---	---	---
Bo:								
Bolivar----------	0-5	3.0-15	---	5.1-6.5	---	---	---	---
	5-12	---	---	5.1-6.5	---	---	---	---
	12-27	---	---	4.5-6.0	---	---	---	---
	27-41	---	---	---	---	---	---	---
	41-45	---	---	---	---	---	---	---
Hector----------	0-3	3.0-16	---	5.1-6.5	---	---	---	---
	3-8	---	---	5.1-6.5	---	---	---	---
	8-15	---	---	4.5-5.5	---	---	---	---
	15-19	---	---	---	---	---	---	---
Br:								
Brazilton-------	0-15	13-32	---	5.1-7.3	---	---	0.0-2.0	---
	15-42	15-39	---	5.1-7.3	---	---	0.0-2.0	---
	42-60	11-31	---	5.1-8.4	---	---	0.0-4.0	---
Cd:								
Catoosa----------	0-12	8.0-32	---	5.6-6.5	---	---	---	---
	12-38	12-41	---	5.1-7.3	---	---	---	---
	38-42	---	0.0-0.0	---	---	---	---	---
Ch:								
Cherokee--------	0-7	5.0-20	---	4.5-7.3	---	---	---	---
	7-13	5.0-19	---	4.5-7.3	---	---	---	---
	13-43	---	---	4.5-6.0	---	---	---	---
	43-60	15-31	---	5.1-7.3	---	---	---	---
De:								
Dennis----------	0-10	6.0-24	---	5.1-6.0	---	---	---	---
	10-15	12-25	10-21	5.1-6.0	---	---	---	---
	15-28	14-36	---	5.1-8.4	---	---	---	---
	28-60	14-35	---	5.1-8.4	---	---	---	---
Ef:								
Eram----------	0-8	13-32	---	5.6-6.5	---	---	0	---
	8-18	15-37	---	5.1-7.3	---	---	0	---
	18-26	15-37	---	5.1-7.3	---	---	0	---
	26-30	---	0.0-0.0	---	---	---	---	---
Eh:								
Eram----------	0-7	13-30	---	5.6-6.5	---	---	0	---
	7-28	15-37	---	5.1-7.3	---	---	0	---
	28-32	---	0.0-0.0	---	---	---	---	---

CHEMICAL PROPERTIES OF THE SOILS--Continued
Labette County, Kansas

Map symbol and soil name	Depth	Cation-exchange capacity	Effective Cation Exchange Capacity	Soil reaction	Calcium carbonate	Gypsum	Salinity	Sodium adsorption ratio
	In	meq/100g	pH	Pct	Pct	mmhos/cm		
Eo:								
Eram	0-8	13-30	---	5.6-6.5	---	---	0	---
	8-28	15-37	---	5.1-7.3	---	---	0	---
	28-32	---	0.0-0.0	---	---	---	---	---
Lebo	0-9	11-27	---	5.6-7.8	0	0	0	0
	9-15	11-27	---	5.6-7.8	0	0	0	0
	15-22	10-25	---	5.6-7.8	0	0	0	0
	22-32	9.0-23	---	5.6-7.8	---	---	---	---
	32-36	---	0.0-0.0	---	0	0	---	---
Es:								
Eram	0-7	13-30	---	5.6-6.5	---	---	0	---
	7-28	15-37	---	5.1-7.3	---	---	0	---
	28-32	---	0.0-0.0	---	---	---	---	---
Nowata	0-8	8.0-22	---	5.6-6.5	---	---	---	---
	8-13	12-25	---	5.6-7.3	---	---	---	---
	13-36	11-23	---	5.6-7.3	---	---	---	---
	36-40	---	0.0-0.0	---	---	---	---	---
He:								
Hepler	0-9	6.0-20	---	4.5-6.5	0	0	0	0
	9-24	6.0-18	---	4.5-6.5	0	0	0	0
	24-44	11-23	---	4.5-6.5	---	---	0	0
	44-60	11-26	---	4.5-6.5	0	0	0	0
HF:								
Hepler	0-10	5.0-17	---	5.6-6.5	---	---	---	---
	10-30	5.0-17	---	4.5-6.5	---	---	---	---
	30-60	10-21	---	4.5-6.5	---	---	---	---
Ka:								
Kanima	0-6	12-34	---	5.6-8.4	---	---	---	---
	6-60	7.0-44	---	5.6-8.4	---	---	---	---
Kb:								
Kanima	0-6	12-34	---	5.6-8.4	---	---	---	---
	6-60	7.0-44	---	5.6-8.4	---	---	---	---
Ke:								
Kenoma	0-6	11-24	---	5.1-6.5	0	0	0.0-2.0	0
	6-13	11-24	---	5.1-6.5	0	0	0.0-2.0	0
	13-26	17-38	---	5.1-7.8	0	0	0.0-2.0	0
	26-49	17-38	---	6.1-8.4	0	0	0.0-2.0	0
	49-60	12-31	---	6.1-8.4	0	0	0.0-4.0	0
Ln:								
Lanton	0-8	9.0-26	---	5.6-6.5	0	0	0	0
	8-37	13-27	---	5.6-6.5	0	0	0	0
	37-60	11-29	---	6.6-7.3	0	0	0	0
M-W:								
Miscellaneous Water	---	---	---	---	---	---	---	---
Od:								
Olpe	0-7	8.0-22	---	5.1-6.5	0	0	0	0
	7-13	8.0-22	---	5.1-6.5	0	0	0	0
	13-30	12-28	---	5.1-6.5	0	0	0	0
	30-44	14-32	---	5.6-7.3	0	0	0	0
	44-60	14-31	---	5.6-7.8	0	0	0	0
Dennis	0-10	6.0-22	---	5.1-6.0	---	---	---	---
	10-15	12-25	10-21	4.5-6.0	---	---	---	---
	15-30	14-35	---	5.1-8.4	---	---	---	---
	30-60	14-35	---	5.1-8.4	---	---	---	---
Or:								
Orthents	0-17	11-32	---	5.6-7.8	---	---	---	---
	17-60	14-38	---	5.6-7.8	---	---	---	---
Os:								
Osage	0-12	18-47	---	5.1-7.8	---	---	---	---
	12-17	18-53	---	5.1-7.8	---	---	---	---
	17-30	15-49	---	5.6-7.8	---	---	---	---
	30-60	15-49	---	5.6-7.8	---	---	---	---
Pe:								
Parsons	0-8	7.0-19	---	5.1-6.5	---	---	0	---
	8-13	---	---	5.1-6.5	---	---	0	---
	13-36	---	---	5.1-7.8	---	---	0	---
	36-60	12-37	---	5.1-7.8	---	---	0	---
Pt:								
Pits, Quarries	0-60	---	---	---	---	---	---	---
Sd:								
Shidler	0-12	9.0-26	---	6.1-8.4	---	---	---	---
	12-16	---	0.0-0.0	---	---	---	---	---
Catoosa	0-12	8.0-32	---	5.6-6.5	---	---	---	---
	12-38	12-41	---	5.1-7.3	---	---	---	---
	38-42	---	0.0-0.0	---	---	---	---	---
Vc:								
Verdigris	0-11	10-24	---	5.6-7.3	---	---	---	---
	11-34	10-24	---	5.6-7.3	---	---	---	---
	34-43	7.0-25	---	5.6-7.3	---	---	---	---
	43-60	7.0-25	---	5.6-7.3	---	---	---	---
Vf:								
Verdigris	0-34	10-24	---	5.6-7.3	---	---	---	---
	34-60	7.0-25	---	5.6-7.3	---	---	---	---

CHEMICAL PROPERTIES OF THE SOILS--Continued
Labette County, Kansas

Map symbol and soil name	Depth	Cation-exchange capacity	Effective Cation Exchange Capacity	Soil reaction	Calcium carbonate	Gypsum	Salinity	Sodium adsorption ratio
	In	meq/100g	pH	Pct	Pct	mmhos/cm		
W:								
Water----------	---	---	---	---	---	---	---	---
Zb:								
Zaar----------	0-7	20-44	---	5.6-7.3	---	---	---	---
	7-17	19-42	---	5.6-7.3	---	---	---	---
	17-54	17-40	---	6.1-8.4	---	---	---	---
	54-60	14-34	---	6.6-8.4	---	---	---	---

WATER FEATURES
Labette County, Kansas

The Water Features table gives estimates of various water features. The estimates are used in land use planning that involves engineering considerations. Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long–duration storms.

The four hydrologic soil groups are:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink–swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

The months in the table indicate the portion of the year in which the feature is most likely to be a concern.

Water table refers to a saturated zone in the soil. The Water Features table indicates, by month, depth to the top (upper limit) and base (lower limit) of the saturated zone in most years. Estimates of the upper and lower limits are based mainly on observations of the water table at selected sites and on evidence of a saturated zone, namely grayish colors or mottles (redoximorphic features) in the soil. A saturated zone that lasts for less than a month is not considered a water table. Ponding is standing water in a closed depression. Unless a drainage system is installed, the water is removed only by percolation, transpiration, or evaporation. The Water Features table indicates surface water depth and the duration and frequency of ponding. Duration is expressed as very brief if less than 2 days, brief if 2 to 7 days, long if 7 to 30 days, and very long if more than 30 days. Frequency is expressed as none, rare, occasional, and frequent. None means that ponding is not probable; rare that it is unlikely but possible under unusual weather conditions (the chance of ponding is nearly 0 percent to 5 percent in any year); occasional that it occurs, on the average, once or less in 2 years (the chance of ponding is 5 to 50 percent in any year); and frequent that it occurs, on the average, more than once in 2 years (the chance of ponding is more than 50 percent in any year).

Flooding, the temporary inundation of an area, is caused by overflowing streams, by runoff from adjacent slopes, or by tides. Water standing for short periods after rainfall or snowmelt is not considered flooding, and water standing in swamps and marshes is considered ponding rather than flooding.

Duration and frequency are estimated. Duration is expressed as extremely brief if 0.1 hour to 4 hours, very brief if 4 hours to 2 days, brief if 2 to 7 days, long if 7 to 30 days, and very long if more than 30 days. Frequency is expressed as none, very rare, rare, occasional, frequent, and very frequent. None means that flooding is not probable; very rare that it is very unlikely but possible under extremely unusual weather conditions (the chance of flooding is less than 1 percent in any year); rare that it is unlikely but possible under unusual weather conditions (the chance of flooding is 1 to 5 percent in any year); occasional that it occurs infrequently under normal weather conditions (the chance of flooding is 5 to 50 percent in any year); frequent that it is likely to occur often under normal weather conditions (the chance of flooding is more than 50 percent in any year but is less than 50 percent in all months in any year); and very frequent that it is likely to occur very often under normal weather conditions (the chance of flooding is more than 50 percent in all months of any year).

The information is based on evidence in the soil profile, namely thin strata of gravel, sand, silt, or clay deposited by floodwater; irregular decrease in organic matter content with increasing depth; and little or no horizon development.

Also considered are local information about the extent and levels of flooding and the relation of each soil on the landscape to historic floods. Information on the extent of flooding based on soil data is less specific than that provided by detailed engineering surveys that delineate flood–prone areas at specific flood frequency levels.

WATER FEATURES--Continued
Labette County, Kansas

(Depths of layers are in feet. See text for definitions of terms used in this table. Estimates of the frequency of ponding and flooding apply to the whole year rather than to individual months. Absence of an entry indicates that the feature is not a concern or that data were not estimated.)

Map symbol and soil name	Hydrologic group	Month	Soil Saturation		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
			Ft	Ft	Ft				
021ES:									
Eram	C								
		January	0.5-1.5	1.5-2.5	---	---	---	---	None
		February	0.5-1.5	1.5-2.5	---	---	---	---	None
		March	0.5-1.5	1.5-2.5	---	---	---	---	None
		December	0.5-1.5	1.5-2.5	---	---	---	---	None
Shidler	D		---	---	---	---	---	---	---
125BF:									
Bates	B		---	---	---	---	---	---	---
Collinsville	D		---	---	---	---	---	---	---
Ae:									
Apperson	C								
		January	1.0-1.5	1.5-2.0	---	---	---	---	None
		February	1.0-1.5	1.5-2.0	---	---	---	---	None
		March	1.0-1.5	1.5-2.0	---	---	---	---	None
		April	1.0-1.5	1.5-2.0	---	---	---	---	None
		December	1.0-1.5	1.5-2.0	---	---	---	---	None
Be:									
Bates	B		---	---	---	---	---	---	---
Bf:									
Bates	B		---	---	---	---	---	---	---
Bm:									
Bates	B		---	---	---	---	---	---	---
Collinsville	D		---	---	---	---	---	---	---
Bo:									
Bolivar	B		---	---	---	---	---	---	---
Hector	D		---	---	---	---	---	---	---
Br:									
Brazilton	D		---	---	---	---	---	---	---
Cd:									
Catoosa	B		---	---	---	---	---	---	---
Ch:									
Cherokee	D								
		January	0.5-1.5	0.8-1.5	---	---	---	---	None
		February	0.5-1.5	0.8-1.5	---	---	---	---	None
		March	0.5-1.5	0.8-1.5	---	---	---	---	None
		April	0.5-1.5	0.8-1.5	---	---	---	---	None
		May	0.5-1.5	0.8-1.5	---	---	---	---	None
		June	0.5-1.5	0.8-1.5	---	---	---	---	None
		December	0.5-1.5	0.8-1.5	---	---	---	---	None
De:									
Dennis	C								
		January	1.0-1.5	2.0-3.0	---	---	---	---	None
		February	1.0-1.5	2.0-3.0	---	---	---	---	None
		March	1.0-1.5	2.0-3.0	---	---	---	---	None
		April	1.0-1.5	2.0-3.0	---	---	---	---	None
		December	1.0-1.5	2.0-3.0	---	---	---	---	None
Ef:									
Eram	C								
		January	0.5-1.5	1.5-2.5	---	---	---	---	None
		February	0.5-1.5	1.5-2.5	---	---	---	---	None
		March	0.5-1.5	1.5-2.5	---	---	---	---	None
		April	0.5-1.5	1.5-2.5	---	---	---	---	None
		November	0.5-1.5	1.5-2.5	---	---	---	---	None
		December	0.5-1.5	1.5-2.5	---	---	---	---	None
Eh:									
Eram	C								
		January	0.5-1.5	1.5-2.5	---	---	---	---	None
		February	0.5-1.5	1.5-2.5	---	---	---	---	None
		March	0.5-1.5	1.5-2.5	---	---	---	---	None
		April	0.5-1.5	1.5-2.5	---	---	---	---	None
		November	0.5-1.5	1.5-2.5	---	---	---	---	None
		December	0.5-1.5	1.5-2.5	---	---	---	---	None
Eo:									
Eram	C								
		January	0.5-1.5	1.5-2.5	---	---	---	---	None
		February	0.5-1.5	1.5-2.5	---	---	---	---	None
		March	0.5-1.5	1.5-2.5	---	---	---	---	None
		April	0.5-1.5	1.5-2.5	---	---	---	---	None
		November	0.5-1.5	1.5-2.5	---	---	---	---	None
		December	0.5-1.5	1.5-2.5	---	---	---	---	None
Lebo	B		---	---	---	---	---	---	---

WATER FEATURES--Continued
Labette County, Kansas

(Depths of layers are in feet. See text for definitions of terms used in this table. Estimates of the frequency of ponding and flooding apply to the whole year rather than to individual months. Absence of an entry indicates that the feature is not a concern or that data were not estimated.)

Map symbol and soil name	Hydrologic group	Month	Soil Saturation		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
			Ft	Ft	Ft				
Es:									
Eram	C								
		January	0.5-1.5	1.5-2.5	---	---	---	---	None
		February	0.5-1.5	1.5-2.5	---	---	---	---	None
		March	0.5-1.5	1.5-2.5	---	---	---	---	None
		April	0.5-1.5	1.5-2.5	---	---	---	---	None
		November	0.5-1.5	1.5-2.5	---	---	---	---	None
		December	0.5-1.5	1.5-2.5	---	---	---	---	None
Nowata	B		---	---	---	---	---	---	---
He:									
Hepler	C								
		January	1.0-3.0	>6.0	---	---	---	---	None
		February	1.0-3.0	>6.0	---	---	---	---	None
		March	1.0-3.0	>6.0	---	---	---	Brief	Occasional
		April	---	---	---	---	---	Brief	Occasional
		May	---	---	---	---	---	Brief	Occasional
		June	---	---	---	---	---	Brief	Occasional
		July	---	---	---	---	---	Brief	Occasional
		August	---	---	---	---	---	Brief	Occasional
		September	---	---	---	---	---	Brief	Occasional
		October	---	---	---	---	---	Brief	Occasional
		November	1.0-3.0	>6.0	---	---	---	---	None
		December	1.0-3.0	>6.0	---	---	---	---	None
HF:									
Hepler	C								
		January	1.0-3.0	>6.0	---	---	---	---	None
		February	1.0-3.0	>6.0	---	---	---	---	None
		March	1.0-3.0	>6.0	---	---	---	Very brief	Frequent
		April	---	---	---	---	---	Very brief	Frequent
		May	---	---	---	---	---	Very brief	Frequent
		June	---	---	---	---	---	Very brief	Frequent
		July	---	---	---	---	---	Very brief	Frequent
		August	---	---	---	---	---	Very brief	Frequent
		September	---	---	---	---	---	Very brief	Frequent
		October	---	---	---	---	---	Very brief	Frequent
		November	1.0-3.0	>6.0	---	---	---	---	None
		December	1.0-3.0	>6.0	---	---	---	---	None
Ka:									
Kanima	C		---	---	---	---	---	---	---
Kb:									
Kanima	C		---	---	---	---	---	---	---
Ke:									
Kenoma	D								
		January	0.5-1.5	1.0-1.5	---	---	---	---	None
		February	0.5-1.5	1.0-1.5	---	---	---	---	None
		March	0.5-1.5	1.0-1.5	---	---	---	---	None
		November	0.5-1.5	1.0-1.5	---	---	---	---	None
		December	0.5-1.5	1.0-1.5	---	---	---	---	None
Ln:									
Lanton	C								
		January	1.0-2.0	2.0-3.5	---	---	---	---	None
		February	1.0-2.0	2.0-3.5	---	---	---	---	None
		March	1.0-2.0	2.0-3.5	---	---	---	Very brief	Occasional
		April	1.0-2.0	2.0-3.5	---	---	---	Very brief	Occasional
		May	---	---	---	---	---	Very brief	Occasional
		June	---	---	---	---	---	Very brief	Occasional
		July	---	---	---	---	---	Very brief	Occasional
		August	---	---	---	---	---	Very brief	Occasional
		September	---	---	---	---	---	Very brief	Occasional
		October	---	---	---	---	---	Very brief	Occasional
		November	1.0-2.0	2.0-3.5	---	---	---	---	None
		December	1.0-2.0	2.0-3.5	---	---	---	---	None
M-W:									
Miscellaneous Water	---		---	---	---	---	---	---	---
Od:									
Olpe	C		---	---	---	---	---	---	---
Dennis	C								
		January	1.0-1.5	2.0-3.0	---	---	---	---	None
		February	1.0-1.5	2.0-3.0	---	---	---	---	None
		March	1.0-1.5	2.0-3.0	---	---	---	---	None
		April	1.0-1.5	2.0-3.0	---	---	---	---	None
		December	1.0-1.5	2.0-3.0	---	---	---	---	None
Or:									
Orthents	D		---	---	---	---	---	---	---
Os:									

WATER FEATURES--Continued
Labette County, Kansas

(Depths of layers are in feet. See text for definitions of terms used in this table. Estimates of the frequency of ponding and flooding apply to the whole year rather than to individual months. Absence of an entry indicates that the feature is not a concern or that data were not estimated.)

Map symbol and soil name	Hydrologic group	Month	Soil Saturation		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
			Ft	Ft	Ft				
Osage	D								
		January	0.0-1.0	>6.0	---	Long	Occasional	---	None
		February	0.0-1.0	>6.0	---	Long	Occasional	---	None
		March	0.0-1.0	>6.0	---	Long	Occasional	Brief	Occasional
		April	0.0-1.0	>6.0	---	Long	Occasional	Brief	Occasional
		May	0.0-1.0	>6.0	---	Long	Occasional	Brief	Occasional
		June	---	---	---	---	---	Brief	Occasional
		July	---	---	---	---	---	Brief	Occasional
		August	---	---	---	---	---	Brief	Occasional
		September	---	---	---	---	---	Brief	Occasional
		October	---	---	---	---	---	Brief	Occasional
		November	0.0-1.0	>6.0	---	Long	Occasional	---	None
		December	0.0-1.0	>6.0	---	Long	Occasional	---	None
Pe:									
Parsons	D								
		January	0.5-1.5	1.0-2.0	---	---	---	---	None
		February	0.5-1.5	1.0-2.0	---	---	---	---	None
		March	0.5-1.5	1.0-2.0	---	---	---	---	None
		April	0.5-1.5	1.0-2.0	---	---	---	---	None
		December	0.5-1.5	1.0-2.0	---	---	---	---	None
Pt:									
Pits, Quarries	---		---	---	---	---	---	---	---
Sd:									
Shidler	D		---	---	---	---	---	---	---
Catoosa	B		---	---	---	---	---	---	---
Vc:									
Verdigris	B								
		January	---	---	---	---	---	Very brief	Rare
		February	---	---	---	---	---	Very brief	Rare
		March	---	---	---	---	---	Very brief	Frequent
		April	---	---	---	---	---	Very brief	Frequent
		May	---	---	---	---	---	Very brief	Frequent
		June	---	---	---	---	---	Very brief	Frequent
		July	---	---	---	---	---	Very brief	Frequent
		August	---	---	---	---	---	Very brief	Frequent
		September	---	---	---	---	---	Very brief	Frequent
		October	---	---	---	---	---	Very brief	Frequent
		November	---	---	---	---	---	Very brief	Frequent
		December	---	---	---	---	---	Very brief	Rare
Vf:									
Verdigris	B								
		March	---	---	---	---	---	Very brief	Occasional
		April	---	---	---	---	---	Very brief	Occasional
		May	---	---	---	---	---	Very brief	Occasional
		June	---	---	---	---	---	Very brief	Occasional
		July	---	---	---	---	---	Very brief	Occasional
		August	---	---	---	---	---	Very brief	Occasional
		September	---	---	---	---	---	Very brief	Occasional
		October	---	---	---	---	---	Very brief	Occasional
W:									
Water	---		---	---	---	---	---	---	---
Zb:									
Zaar	D								
		January	1.0-2.0	>6.0	---	---	---	---	None
		February	1.0-2.0	>6.0	---	---	---	---	None
		March	1.0-2.0	>6.0	---	---	---	---	None
		April	1.0-2.0	>6.0	---	---	---	---	None
		December	1.0-2.0	>6.0	---	---	---	---	None

SOIL FEATURES
Labette County, Kansas

The following table gives estimates of various soil features. The estimates are used in land use planning that involves engineering considerations.

A restrictive layer is a nearly continuous layer that has one or more physical, chemical, or thermal properties that significantly impede the movement of water and air through the soil or that restrict roots or otherwise provide an unfavorable root environment. Examples are bedrock, cemented layers, dense layers, and frozen layers. The table indicates the hardness and thickness of the restrictive layer, both of which significantly affect the ease of excavation. Depth to top is the vertical distance from the soil surface to the upper boundary of the restrictive layer.

Potential for frost action is the likelihood of upward or lateral expansion of the soil caused by the formation of segregated ice lenses (frost heave) and the subsequent collapse of the soil and loss of strength on thawing. Frost action occurs when moisture moves into the freezing zone of the soil. Temperature, texture, density, permeability, content of organic matter, and depth to the water table are the most important factors considered in evaluating the potential for frost action. It is assumed that the soil is not insulated by vegetation or snow and is not artificially drained. Silty and highly structured, clayey soils that have a high water table in winter are the most susceptible to frost action. Well drained, very gravelly, or very sandy soils are the least susceptible. Frost heave and low soil strength during thawing cause damage to pavements and other rigid structures.

Risk of corrosion pertains to potential soil-induced electrochemical or chemical action that corrodes or weakens uncoated steel or concrete. The rate of corrosion of uncoated steel is related to such factors as soil moisture, particle-size distribution, acidity, and electrical conductivity of the soil. The rate of corrosion of concrete is based mainly on the sulfate and sodium content, texture, moisture content, and acidity of the soil. Special site examination and design may be needed if the combination of factors results in a severe hazard of corrosion. The steel or concrete in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than the steel or concrete in installations that are entirely within one kind of soil or within one soil layer.

For uncoated steel, the risk of corrosion, expressed as low, moderate, or high, is based on soil drainage class, total acidity, electrical resistivity near field capacity, and electrical conductivity of the saturation extract.

For concrete, the risk of corrosion also is expressed as low, moderate, or high. It is based on soil texture, acidity, and amount of sulfates in the saturation extract.

SOIL FEATURES--Continued
Labette County, Kansas

Map symbol and soil name	Restrictive layer				Potential for Frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness		Uncoated Steel	Concrete
		In	In				
021ES:							
Eram	20-40	Bedrock (paralithic)	---	Moderately cemented	---	High	Moderate
Shidler	10-20	Bedrock (lithic)	---	Indurated	---	Moderate	Low
125BF:							
Bates	20-40	Bedrock (paralithic)	---	Moderately cemented	---	Low	Moderate
Collinsville	4-20	Bedrock (lithic)	---	Strongly cemented	---	Low	Moderate
Ae:							
Apperson	40-60	Bedrock (lithic)	---	Indurated	---	High	Low
AED:							
Arents, Earthen Dam	---	---	---	---	---	---	---
Be:							
Bates	20-40	Bedrock (paralithic)	---	Moderately cemented	---	Low	Moderate
Bf:							
Bates	20-40	Bedrock (paralithic)	---	Moderately cemented	---	Low	Moderate
Bm:							
Bates	20-40	Bedrock (paralithic)	---	Moderately cemented	---	Low	Moderate
Collinsville	4-20	Bedrock (lithic)	---	Strongly cemented	---	Low	Moderate
Bo:							
Bolivar	20-40	Bedrock (paralithic)	---	Moderately cemented	---	Low	Moderate
Hector	10-20	Bedrock (lithic)	---	Strongly cemented	---	Low	Moderate
Br:							
Brazilton	---	---	---	---	---	High	Moderate
Cd:							
Catoosa	20-40	Bedrock (lithic)	---	Indurated	---	Moderate	Moderate
Ch:							
Cherokee	---	---	---	---	---	High	Moderate
De:							
Dennis	---	---	---	---	---	High	Moderate
Ef:							
Eram	20-40	Bedrock (paralithic)	---	Weakly cemented	None	High	Moderate
Eh:							
Eram	20-40	Bedrock (paralithic)	---	Weakly cemented	None	High	Moderate
Eo:							
Eram	20-40	Bedrock (paralithic)	---	Weakly cemented	None	High	Moderate
Lebo	20-40	Bedrock (paralithic)	---	Weakly cemented	None	Moderate	Low
Es:							
Eram	20-40	Bedrock (paralithic)	---	Weakly cemented	None	High	Moderate
Nowata	20-40	Bedrock (lithic)	---	Indurated	---	Moderate	Moderate
He:							
Hepler	---	---	---	---	---	High	Moderate
HF:							
Hepler	---	---	---	---	---	High	Moderate
Ka:							
Kanima	---	---	---	---	None	Moderate	Low
Kb:							
Kanima	---	---	---	---	None	Moderate	Low
Ke:							
Kenoma	---	---	---	---	---	High	Moderate
Ln:							
Lanton	---	---	---	---	None	High	Moderate
M-W:							
Miscellaneous Water	---	---	---	---	---	---	---
Od:							
Olpe	---	---	---	---	---	High	Moderate
Dennis	---	---	---	---	---	High	Moderate
Or:							
Orthents	---	---	---	---	Low	High	Moderate
Os:							
Osage	---	---	---	---	---	High	Moderate
Pe:							
Parsons	---	---	---	---	None	High	Moderate
Pt:							
Pits, Quarries	---	---	---	---	---	---	---
Sd:							
Shidler	4-20	Bedrock (lithic)	---	Indurated	---	Moderate	Low
Catoosa	20-40	Bedrock (lithic)	---	Indurated	---	Moderate	Moderate
Vc:							
Verdigris	---	---	---	---	---	Low	Low
Vf:							
Verdigris	---	---	---	---	---	Low	Low
W:							
Water	---	---	---	---	Low	---	---
Zb:							
Zaar	---	---	---	---	---	High	Moderate

SOIL FEATURES--Continued
Labette County, Kansas

Map symbol and soil name	Restrictive layer				Potential for Frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness		Uncoated Steel	Concrete
		In	In				

WATER MANAGEMENT
Labette County, Kansas

The soils of the survey area are rated in the Water Management table according to limitations that affect their suitability for water management. Soils are rated for pond reservoir areas, drainage, irrigation, terraces and diversions, and grassed waterways. Restrictive features that affect each soil for the specified use is also provided in the table.

The ratings in the table are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect the specified use. Not limited indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. Slightly limited indicates that the soil has features that are favorable for the specified use. The limitations are minor and can be easily overcome. Good performance and low maintenance can be expected. Moderately limited indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. Limited indicates that the soil has one or more features that are significant limitations for the specified use. The limitations can be overcome, but generally require special design, soil reclamation, or installation procedures that may result in additional expense. Fair performance and moderate to high maintenance can be expected. Very limited indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Limitation class terms, such as very limited or limited, etc., limitation ratings, and numerical ratings are shown for each soil feature listed. As many as three soil features may be listed for each soil component if applicable. The overall limitation rating for the soil component is based on the most severe limitation.

Pond reservoir areas hold water behind a dam or embankment. Soils best suited to this use have low seepage potential in the upper 60 inches. The seepage potential is determined by the permeability of the soil and the depth to fractured bedrock or other permeable material. Excessive slope can affect the storage capacity of the reservoir area.

Embankments, dikes, and levees are raised structures of soil material, generally less than 20 feet high, constructed to impound water or to protect land against overflow. In this table, the soils are rated as a source of material for embankment fill. The ratings apply to the soil material below the surface layer to a depth of about 5 feet. It is assumed that soil layers will be uniformly mixed and compacted during construction.

The ratings do not indicate the ability of the natural soil to support an embankment. Soil properties to a depth even greater than the height of the embankment can affect performance and safety of the embankment. Generally, deeper onsite investigation is needed to determine these properties.

Soil material in embankments must be resistant to seepage, piping, and erosion and have favorablecompaction characteristics. Unfavorable features include less than 5 feet of suitable material and a high content of stones or boulders, organic matter, or salts or sodium. A high water table affects theamount of usable material. It also affects traffic ability.

Aquifer−fed excavated ponds are pits or dugouts that extend to a ground−water aquifer or to a depth below a permanent water table. Excluded are ponds that are fed only by surface runoff and embankment ponds that impound water 3 feet or more above the original surface. Excavated ponds are affected by depth to a permanent water table, permeability of the aquifer, and quality of the water as inferred from the salinity of the soil. Depth to bedrock and the content of large stones affect the ease of excavation.

Drainage is the removal of excess surface and subsurface water from the soil. How easily and effectively the soil is drained depends on the depth to bedrock, to a cemented pan, or to other layers that affect the rate of water movement; permeability; depth to a high water table or depth of standing water if the soil is subject to ponding; slope; susceptibility to flooding; subsidence of organic layers; and the potential for frost action. Excavating and grading and the stability of ditch banks are affected by depth to bedrock or to a cemented pan, large stones, slope, and the hazard of cutbanks caving. The productivity of the soil after drainage is adversely affected by extreme acidity or by toxic substances in the root zone, such as salts, sodium, and sulfur. Availability of drainage outlets is not considered in the ratings.

Irrigation is the controlled application of water to supplement rainfall and support plant growth. The design and management of an irrigation system are affected by depth to the water table, the need for drainage, flooding, available water capacity, intake rate, permeability, erosion hazard, and slope. The construction of a system is affected by large stones and depth to bedrock or to a cemented pan. The performance of a system is affected by the depth of the root zone, the amount of salts or sodium, and soil reaction.

Terraces and diversions are embankments or a combination of channels and ridges constructed across a slope to control erosion and conserve moisture by intercepting runoff. Slope, wetness, large stones, and depth to bedrock or to a cemented pan affect the construction of terraces and diversions. A restricted rooting depth, a very limited hazard of wind erosion or water erosion, an excessively coarse texture, and restricted permeability adversely affect maintenance.

Grassed waterways are natural or constructed channels, generally broad and shallow, which conduct surface water to outlets at a non−erosive velocity. Large stones, wetness, slope, and depth to bedrock or to a cemented pan affect the construction of grassed waterways. A hazard of wind erosion, low available water capacity, restricted rooting depth, toxic substances such as salts and sodium, and restricted permeability adversely affect the growth and maintenance of the grass after construction.

WATER MANAGEMENT--Continued
Labette County, Kansas

(The information in this report indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Map symbol and soil name	Features affecting--			
	Drainage	Irrigation	Terraces and diversions	Grassed waterways
021ES:				
Eram	Limitation: percs slowly slope depth to rock	Limitation: percs slowly slope wetness	Limitation: erodes easily slope depth to rock	Limitation: erodes easily slope wetness
Shidler	Limitation: deep to water	Limitation: slope depth to rock	Limitation: large stones depth to rock	Limitation: large stones depth to rock
125BF:				
Bates	Limitation: deep to water	Limitation: thin layer	Limitation: area reclaim	Limitation: area reclaim
Collinsville	Limitation: deep to water	Limitation: thin layer	Limitation: area reclaim large stones depth to rock	Limitation: area reclaim large stones depth to rock
Ae:				
Apperson	Limitation: percs slowly	Limitation: percs slowly wetness	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly
AED:				
Arents, Earthen Dam	---	---	---	---
Be:				
Bates	Limitation: deep to water	Limitation: thin layer	Limitation: area reclaim	Limitation: area reclaim
Bf:				
Bates	Limitation: deep to water	Limitation: slope thin layer	Limitation: area reclaim	Limitation: area reclaim
Bm:				
Bates	Limitation: deep to water	Limitation: slope thin layer	Limitation: area reclaim	Limitation: area reclaim
Collinsville	Limitation: deep to water	Limitation: slope thin layer	Limitation: large stones slope depth to rock	Limitation: large stones slope depth to rock
Bo:				
Bolivar	Limitation: deep to water	Limitation: slope thin layer	Limitation: area reclaim slope	Limitation: area reclaim slope
Hector	Limitation: deep to water	Limitation: slope thin layer droughty	Limitation: area reclaim slope depth to rock	Limitation: slope depth to rock droughty
Br:				
Brazilton	Limitation: deep to water	Limitation: erodes easily percs slowly	Limitation: erodes easily percs slowly	Limitation: erodes easily percs slowly
Cd:				
Catoosa	Limitation: deep to water	Limitation: rooting depth thin layer	Limitation: area reclaim erodes easily depth to rock	Limitation: area reclaim erodes easily depth to rock
Ch:				
Cherokee	Limitation: percs slowly	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness
De:				
Dennis	Limitation: percs slowly	Limitation: percs slowly rooting depth wetness	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly rooting depth
Ef:				
Eram	Limitation: percs slowly thin layer	Limitation: erodes easily percs slowly thin layer	Limitation: area reclaim erodes easily wetness	Limitation: area reclaim erodes easily wetness
Eh:				
Eram	Limitation: percs slowly slope thin layer	Limitation: percs slowly slope thin layer	Limitation: area reclaim erodes easily wetness	Limitation: area reclaim erodes easily wetness
Eo:				
Eram	Limitation: percs slowly slope thin layer	Limitation: percs slowly slope thin layer	Limitation: area reclaim erodes easily slope	Limitation: erodes easily slope wetness
Lebo	Limitation: deep to water	Limitation: slope thin layer	Limitation: area reclaim slope	Limitation: area reclaim slope

WATER MANAGEMENT--Continued
Labette County, Kansas

(The information in this report indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Map symbol and soil name	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
Es:				
Eram	Limitation: percs slowly slope thin layer	Limitation: percs slowly slope thin layer	Limitation: area reclaim erodes easily wetness	Limitation: area reclaim erodes easily wetness
Nowata	Limitation: deep to water	Limitation: large stones rooting depth thin layer	Limitation: area reclaim large stones depth to rock	Limitation: erodes easily large stones depth to rock
He:				
Hepler	Limitation: flooding	Limitation: erodes easily flooding wetness	Limitation: erodes easily wetness	Limitation: erodes easily wetness
HF:				
Hepler	Limitation: flooding	Limitation: erodes easily flooding wetness	Limitation: erodes easily wetness	Limitation: erodes easily wetness
Ka:				
Kanima	Limitation: deep to water	Limitation: slope droughty	Favorable	Limitation: droughty
Kb:				
Kanima	Limitation: deep to water	Limitation: slope droughty	Limitation: slope	Limitation: slope droughty
Ke:				
Kenoma	Limitation: percs slowly	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness
Ln:				
Lanton	Limitation: flooding percs slowly	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness
M-W:				
Miscellaneous Water	---	---	---	---
Od:				
Olpe	Limitation: deep to water	Limitation: percs slowly slope droughty	Limitation: erodes easily percs slowly	Limitation: erodes easily droughty
Dennis	Limitation: percs slowly slope	Limitation: percs slowly rooting depth wetness	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly rooting depth
Or:				
Orthents	Limitation: deep to water	Limitation: percs slowly droughty	Limitation: percs slowly	Limitation: percs slowly droughty
Os:				
Osage	Limitation: flooding percs slowly	Limitation: percs slowly slow intake wetness	Limitation: percs slowly wetness	Limitation: percs slowly wetness
Pe:				
Parsons	Limitation: percs slowly	Limitation: erodes easily percs slowly	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness
Pt:				
Pits, Quarries	---	---	---	---
Sd:				
Shidler	Limitation: deep to water	Limitation: erodes easily slope thin layer	Limitation: area reclaim depth to rock	Limitation: area reclaim depth to rock
Catoosa	Limitation: deep to water	Limitation: rooting depth slope thin layer	Limitation: area reclaim erodes easily	Limitation: area reclaim erodes easily
Vc:				
Verdigris	Limitation: deep to water	Limitation: flooding	Favorable	Favorable
Vf:				
Verdigris	Limitation: deep to water	Limitation: flooding	Favorable	Favorable
W:				
Water	---	---	---	---

WATER MANAGEMENT--Continued
Labette County, Kansas

(The information in this report indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Map symbol and soil name	Features affecting--			
	Drainage	Irrigation	Terraces and diversions	Grassed waterways
Zb: Zaar	Limitation: percs slowly	Limitation: percs slowly slow intake wetness	Limitation: percs slowly wetness	Limitation: percs slowly wetness

WATER MANAGEMENT--Continued
Labette County, Kansas

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Pond Reservoir Area		Embankments, Dikes, and Levees		Excavated Ponds (Aquifer-fed)	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
021ES:							
Eram	50	Somewhat limited		Very limited		Very limited	
		Depth to bedrock	0.23	Depth to saturated zone	1.00	Deep to water	1.00
				Thin layer	0.95		
				Hard to pack	0.92		
Shidler	40	Very limited		Very limited		Very limited	
		Seepage	1.00	Thin layer	1.00	Deep to water	1.00
		Depth to bedrock	1.00	Piping	0.08		
125BF:							
Bates	50	Somewhat limited		Somewhat limited		Very limited	
		Depth to bedrock	0.09	Thin layer	0.83	Deep to water	1.00
		Seepage	0.05				
Collinsville	40	Very limited		Very limited		Very limited	
		Seepage	1.00	Thin layer	1.00	Deep to water	1.00
		Depth to bedrock	1.00	Piping	1.00		
				Seepage	0.09		
Ae:							
Apperson	85	Somewhat limited		Very limited		Very limited	
		Depth to bedrock	0.13	Depth to saturated zone	1.00	Deep to water	1.00
		Seepage	0.05	Hard to pack	0.83		
				Thin layer	0.13		
AED:							
Arents, Earthen Dam-	100	Not rated		Not rated		Not rated	
Be:							
Bates	85	Somewhat limited		Somewhat limited		Very limited	
		Depth to bedrock	0.11	Thin layer	0.86	Deep to water	1.00
		Seepage	0.01				
Bf:							
Bates	85	Somewhat limited		Somewhat limited		Very limited	
		Depth to bedrock	0.23	Thin layer	0.95	Deep to water	1.00
		Seepage	0.01				
Bm:							
Bates	50	Somewhat limited		Somewhat limited		Very limited	
		Depth to bedrock	0.19	Thin layer	0.93	Deep to water	1.00
		Seepage	0.01				
Collinsville	35	Very limited		Very limited		Very limited	
		Seepage	1.00	Thin layer	1.00	Deep to water	1.00
		Depth to bedrock	1.00	Seepage	0.09		
Bo:							
Bolivar	65	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Thin layer	0.93	Deep to water	1.00
		Depth to bedrock	0.19	Piping	0.31		
		Slope	0.00				
Hector	25	Very limited		Very limited		Very limited	
		Seepage	1.00	Thin layer	1.00	Deep to water	1.00
		Depth to bedrock	1.00	Seepage	0.09		
		Slope	0.00				
Br:							
Brazilton	100	Somewhat limited		Not limited		Very limited	
		Seepage	0.70			Deep to water	1.00
Cd:							
Catoosa	90	Somewhat limited		Somewhat limited		Very limited	
		Depth to bedrock	0.56	Hard to pack	0.96	Deep to water	1.00
		Seepage	0.05	Thin layer	0.56		
Ch:							
Cherokee	100	Somewhat limited		Very limited		Very limited	
		Seepage	0.05	Depth to saturated zone	1.00	Deep to water	1.00
				Hard to pack	0.83		
De:							
Dennis	90	Not limited		Very limited		Very limited	

WATER MANAGEMENT--Continued
Labette County, Kansas

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Pond Reservoir Area		Embankments, Dikes, and Levees		Excavated Ponds (Aquifer-fed)	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
				Depth to saturated zone	1.00	Deep to water	1.00
				Hard to pack	0.69		
Ef:							
Eram	85	Somewhat limited		Very limited		Very limited	
		Depth to bedrock	0.23	Depth to saturated zone	1.00	Deep to water	1.00
				Hard to pack	0.99		
				Thin layer	0.95		
Eh:							
Eram	88	Somewhat limited		Very limited		Very limited	
		Depth to bedrock	0.17	Depth to saturated zone	1.00	Deep to water	1.00
				Hard to pack	0.99		
				Thin layer	0.91		
Eo:							
Eram	60	Somewhat limited		Very limited		Very limited	
		Depth to bedrock	0.17	Depth to saturated zone	1.00	Deep to water	1.00
				Hard to pack	1.00		
				Thin layer	0.91		
Lebo	20	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Thin layer	0.81	Deep to water	1.00
		Depth to bedrock	0.08	Piping	0.15		
		Slope	0.00				
Es:							
Eram	50	Somewhat limited		Very limited		Very limited	
		Depth to bedrock	0.17	Depth to saturated zone	1.00	Deep to water	1.00
				Thin layer	0.91		
				Hard to pack	0.88		
Nowata	30	Somewhat limited		Somewhat limited		Very limited	
		Depth to bedrock	0.66	Thin layer	0.66	Deep to water	1.00
		Seepage	0.05				
He:							
Hepler	95	Somewhat limited		Very limited		Somewhat limited	
		Seepage	0.70	Depth to saturated zone	1.00	Slow refill	0.30
						Cutbanks cave	0.10
						Deep to water	0.00
HF:							
Hepler	95	Somewhat limited		Very limited		Somewhat limited	
		Seepage	0.70	Depth to saturated zone	1.00	Slow refill	0.30
				Piping	0.25	Cutbanks cave	0.10
						Deep to water	0.00
Ka:							
Kanima	100	Somewhat limited		Not limited		Very limited	
		Seepage	0.70			Deep to water	1.00
Kb:							
Kanima	95	Somewhat limited		Not limited		Very limited	
		Seepage	0.70			Deep to water	1.00
		Slope	0.12				
Ke:							
Kenoma	85	Not limited		Very limited		Very limited	
				Depth to saturated zone	1.00	Deep to water	1.00
				Hard to pack	0.69		
Ln:							
Lanton	95	Somewhat limited		Very limited		Very limited	
		Seepage	0.05	Depth to saturated zone	1.00	Deep to water	1.00
M-W:							
Miscellaneous Water-	100	Not rated		Not rated		Not rated	

WATER MANAGEMENT--Continued
Labette County, Kansas

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Pond Reservoir Area		Embankments, Dikes, and Levees		Excavated Ponds (Aquifer-fed)	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Od:							
Olpe	50	Somewhat limited Seepage	 0.05	Not limited		Very limited Deep to water	 1.00
Dennis	35	Not limited		Very limited Depth to saturated zone Hard to pack	 1.00 0.70	Very limited Deep to water	 1.00
Or:							
Orthents	100	Not limited		Somewhat limited Hard to pack	 0.99	Very limited Deep to water	 1.00
Os:							
Osage	93	Somewhat limited Seepage	 0.01	Very limited Ponding Depth to saturated zone Hard to pack	 1.00 1.00 1.00	Somewhat limited Slow refill Cutbanks cave	 0.95 0.10
Pe:							
Parsons	91	Somewhat limited Seepage	 0.05	Very limited Depth to saturated zone Hard to pack	 1.00 0.68	Very limited Deep to water	 1.00
Pt:							
Pits, Quarries	100	Not rated		Not rated		Not rated	
Sd:							
Shidler	50	Very limited Seepage Depth to bedrock	 1.00 1.00	Very limited Thin layer Piping	 1.00 0.82	Very limited Deep to water	 1.00
Catoosa	35	Somewhat limited Depth to bedrock Seepage	 0.56 0.05	Somewhat limited Hard to pack Thin layer	 0.96 0.56	Very limited Deep to water	 1.00
Vc:							
Verdigris	85	Somewhat limited Seepage	 0.70	Somewhat limited Piping	 0.09	Very limited Deep to water	 1.00
Vf:							
Verdigris	95	Somewhat limited Seepage	 0.70	Somewhat limited Piping	 0.31	Very limited Deep to water	 1.00
W:							
Water	100	Not rated		Not rated		Not rated	
Zb:							
Zaar	85	Not limited		Very limited Depth to saturated zone Hard to pack	 1.00 0.86	Very limited Deep to water	 1.00

SANITARY FACILITIES
Labette County, Kansas

Sanitary Facilities

The following tables show the degree and kind of soil limitations that affect septic tank absorption fields, sewage lagoons, sanitary landfills, and daily cover for landfill. The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect these uses. Not limited indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. Slightly limited indicates that the soil has features that are favorable for the specified use. The limitations are minor and can be easily overcome. Good performance and low maintenance can be expected. Somewhat limited indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. Very limited indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the tables indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.00 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

Septic tank absorption fields are areas in which effluent from a septic tank is distributed into the soil through subsurface tiles or perforated pipe. Only that part of the soil between depths of 24 and 60 inches is evaluated. The ratings are based on the soil properties that affect absorption of the effluent, construction and maintenance of the system, and public health. Permeability, depth to a water table, ponding, depth to bedrock or a cemented pan, and flooding affect absorption of the effluent. Stones and boulders, ice, and bedrock or a cemented pan interfere with installation. Subsidence interferes with installation and maintenance. Excessive slope may cause lateral seepage and surfacing of the effluent in downslope areas.

Some soils are underlain by loose sand and gravel or fractured bedrock at a depth of less than 4 feet below the distribution lines. In these soils the absorption field may not adequately filter the effluent, particularly when the system is new. As a result, the ground water may become contaminated.

Sewage lagoons are shallow ponds constructed to hold sewage while aerobic bacteria decompose the solid and liquid wastes. Lagoons should have a nearly level floor surrounded by cut slopes or embankments of compacted soil. Nearly impervious soil material for the lagoon floor and sides is required to minimize seepage and contamination of ground water. Considered in the ratings are slope, permeability, depth to a water table, ponding, depth to bedrock or a cemented pan, flooding, large stones, and content of organic matter.

Soil permeability is a critical property affecting the suitability for sewage lagoons. Most porous soils eventually become sealed when they are used as sites for sewage lagoons. Until sealing occurs, however, the hazard of pollution is severe. Soils that have a permeability rate of more than 2 inches per hour are too porous for the proper functioning of sewage lagoons. In these soils, seepage of the effluent can result in contamination of the ground water. Ground-water contamination is also a hazard if fractured bedrock is within a depth of 40 inches, if the water table is high enough to raise the level of sewage in the lagoon, or if floodwater overtops the lagoon.

A high content of organic matter is detrimental to proper functioning of the lagoon because it inhibits aerobic activity. Slope, bedrock, and cemented pans can cause construction problems, and large stones can hinder compaction of the lagoon floor. If the lagoon is to be uniformly deep throughout, the slope must be gentle enough and the soil material must be thick enough over bedrock or a cemented pan to make land smoothing practical.

A trench sanitary landfill is an area where solid waste is placed in successive layers in an excavated trench. The waste is spread, compacted, and covered daily with a thin layer of soil excavated at the site. When the trench is full, a final cover of soil material at least 2 feet thick is placed over the landfill. The ratings in the table are based on the soil properties that affect the risk of pollution, the ease of excavation, trafficability, and revegetation. These properties include permeability, depth to bedrock or a cemented pan, depth to a water table, ponding, slope, flooding, texture, stones and boulders, highly organic layers, soil reaction, and content of salts and sodium. Unless otherwise stated, the ratings apply only to that part of the soil within a depth of about 6 feet. For deeper trenches, onsite investigation may be needed.

Hard, nonrippable bedrock, creviced bedrock, or highly permeable strata in or directly below the proposed trench bottom can affect the ease of excavation and the hazard of ground-water pollution. Slope affects construction of the trenches and the movement of surface water around the landfill. It also affects the construction and performance of roads in areas of the landfill.

Soil texture and consistence affect the ease with which the trench is dug and the ease with which the soil can be used as daily or final cover. They determine the workability of the soil when dry and when wet. Soils that are plastic and sticky when wet are difficult to excavate, grade, or compact and are difficult to place as a uniformly thick cover over a layer of refuse.

The soil material used as the final cover for a trench landfill should be suitable for plants. It should not have excess sodium or salts and should not be too acid. The surface layer generally has the best workability, the highest content of organic matter, and the best potential for plants. Material from the surface layer should be stockpiled for use as the final cover.

SANITARY FACILITIES
Labette County, Kansas

In an area sanitary landfill, solid waste is placed in successive layers on the surface of the soil. The waste is spread, compacted, and covered daily with a thin layer of soil from a source away from the site. A final cover of soil material at least 2 feet thick is placed over the completed landfill. The ratings in the table are based on the soil properties that affect trafficability and the risk of pollution. These properties include flooding, permeability, depth to a water table, ponding, slope, and depth to bedrock or a cemented pan.

Flooding is a serious problem because it can result in pollution in areas downstream from the landfill. If permeability is too rapid or if fractured bedrock, a fractured cemented pan, or the water table is close to the surface, the leachate can contaminate the water supply. Slope is a consideration because of the extra grading required to maintain roads in the steeper areas of the landfill. Also, leachate may flow along the surface of the soils in the steeper areas and cause difficult seepage problems.

Daily cover for landfill is the soil material that is used to cover compacted solid waste in an area sanitary landfill. The soil material is obtained offsite, transported to the landfill, and spread over the waste. The ratings in the table also apply to the final cover for a landfill. They are based on the soil properties that affect workability, the ease of digging, and the ease of moving and spreading the material over the refuse daily during wet and dry periods. These properties include soil texture, depth to a water table, ponding, rock fragments, slope, depth to bedrock or a cemented pan, reaction, and content of salts, sodium, or lime.

Loamy or silty soils that are free of large stones and excess gravel are the best cover for a landfill. Clayey soils may be sticky and difficult to spread; sandy soils are subject to wind erosion.

Slope affects the ease of excavation and of moving the cover material. Also, it can influence runoff, erosion, and reclamation of the borrow area.

After soil material has been removed, the soil material remaining in the borrow area must be thick enough over bedrock, a cemented pan, or the water table to permit revegetation. The soil material used as the final cover for a landfill should be suitable for plants. It should not have excess sodium, salts, or lime and should not be too acid.

SANITARY FACILITIES--Continued
Labette County, Kansas

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
021ES:					
Eram	50	Very limited		Very limited	
		Restricted permeability	1.00	Depth to soft bedrock	1.00
		Depth to bedrock	1.00	Slope	1.00
		Depth to saturated zone	1.00		
		Slope	0.04		
Shidler	40	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
				Slope	0.91
125BF:					
Bates	50	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Restricted permeability	1.00	Seepage	0.50
				Slope	0.03
Collinsville	40	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
				Seepage	1.00
				Slope	0.09
Ae:					
Apperson	85	Very limited		Somewhat limited	
		Restricted permeability	1.00	Depth to hard bedrock	0.54
		Depth to saturated zone	1.00	Slope	0.00
		Depth to bedrock	0.83		
AED:					
Arents, Earthen Dam	100	Not rated		Not rated	
Be:					
Bates	85	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Restricted permeability	1.00	Seepage	0.50
				Slope	0.00
Bf:					
Bates	85	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Restricted permeability	1.00	Slope	0.67
Bm:					
Bates	50	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Restricted permeability	1.00	Slope	0.91
Collinsville	35	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	0.16	Seepage	1.00
				Slope	1.00
Bo:					
Bolivar	65	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Slope	0.63	Seepage	1.00
		Restricted permeability	0.50	Slope	1.00
Hector	25	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	0.63	Seepage	1.00
				Slope	1.00
Br:					
Brazilton	100	Very limited		Somewhat limited	
		Restricted permeability	1.00	Seepage	0.50
				Slope	0.09
Cd:					
Catoosa	90	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00

SANITARY FACILITIES--Continued
Labette County, Kansas

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
		Restricted permeability	1.00	Slope	0.00
Ch:					
Cherokee	100	Very limited		Somewhat limited	
		Restricted permeability	1.00	Seepage	0.50
		Depth to saturated zone	1.00		
De:					
Dennis	90	Very limited		Somewhat limited	
		Restricted permeability	1.00	Slope	0.00
		Depth to saturated zone	1.00		
Ef:					
Eram	85	Very limited		Very limited	
		Restricted permeability	1.00	Depth to soft bedrock	1.00
		Depth to bedrock	1.00	Slope	0.00
		Depth to saturated zone	1.00		
Eh:					
Eram	88	Very limited		Very limited	
		Restricted permeability	1.00	Depth to soft bedrock	1.00
		Depth to bedrock	1.00	Slope	0.67
		Depth to saturated zone	1.00		
Eo:					
Eram	60	Very limited		Very limited	
		Restricted permeability	1.00	Depth to soft bedrock	1.00
		Depth to bedrock	1.00	Slope	1.00
		Depth to saturated zone	1.00		
		Slope	0.00		
Lebo	20	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Slope	0.63	Slope	1.00
		Restricted permeability	0.50	Seepage	0.50
Es:					
Eram	50	Very limited		Very limited	
		Restricted permeability	1.00	Depth to soft bedrock	1.00
		Depth to bedrock	1.00	Slope	0.67
		Depth to saturated zone	1.00		
Nowata	30	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Restricted permeability	1.00	Slope	0.67
He:					
Hepler	95	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Restricted permeability	1.00	Seepage	0.50
HF:					
Hepler	95	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Restricted permeability	1.00	Seepage	0.50
				Slope	0.00
Ka:					
Kanima	100	Somewhat limited		Somewhat limited	
		Restricted permeability	0.50	Slope	0.67
				Seepage	0.50
Kb:					
Kanima	95	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Restricted permeability	0.50	Seepage	0.50

SANITARY FACILITIES--Continued
Labette County, Kansas

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
Ke:					
Kenoma	85	Very limited		Somewhat limited	
		Restricted permeability	1.00	Slope	0.00
		Depth to saturated zone	1.00		
Ln:					
Lanton	95	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Restricted permeability	1.00	Depth to saturated zone	0.00
		Depth to saturated zone	1.00		
M-W:					
Miscellaneous Water-	100	Not rated		Not rated	
Od:					
Olpe	50	Very limited		Somewhat limited	
		Restricted permeability	1.00	Slope	0.67
				Seepage	0.50
Dennis	35	Very limited		Somewhat limited	
		Restricted permeability	1.00	Slope	0.67
		Depth to saturated zone	1.00		
Or:					
Orthents	100	Very limited		Somewhat limited	
		Restricted permeability	1.00	Slope	0.00
Os:					
Osage	93	Very limited		Very limited	
		Flooding	1.00	Ponding	1.00
		Restricted permeability	1.00	Flooding	1.00
		Ponding	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00		
Pe:					
Parsons	91	Very limited		Somewhat limited	
		Restricted permeability	1.00	Seepage	0.50
		Depth to saturated zone	1.00		
Pt:					
Pits, Quarries	100	Not rated		Not rated	
Sd:					
Shidler	50	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
				Slope	0.67
Catoosa	35	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Restricted permeability	1.00	Slope	0.67
Vc:					
Verdigris	85	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Restricted permeability	0.50	Seepage	0.50
Vf:					
Verdigris	95	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Restricted permeability	0.50	Seepage	0.50
W:					
Water	100	Not rated		Not rated	
Zb:					
Zaar	85	Very limited		Not limited	
		Restricted permeability	1.00		
		Depth to saturated zone	1.00		

SANITARY FACILITIES--Continued
Labette County, Kansas

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
021ES:							
Eram	50	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Too clayey	1.00
		Too clayey	1.00	Slope	0.04	Depth to saturated zone	1.00
		Slope	0.04			Hard to compact	1.00
						Slope	0.04
Shidler	40	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Seepage	1.00			Too clayey	0.50
		Too clayey	0.50				
125BF:							
Bates	50	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Too clayey	0.50			Too clayey	0.50
Collinsville	40	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Seepage	1.00			Seepage	0.50
Ae:							
Apperson	85	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Too clayey	1.00
		Depth to bedrock	1.00	Depth to bedrock	0.54	Depth to saturated zone	1.00
		Too clayey	1.00			Hard to compact	1.00
		Seepage	1.00			Depth to bedrock	0.54
AED:							
Arents, Earthen Dam	100	Not rated		Not rated		Not rated	
Be:							
Bates	85	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Too clayey	0.50			Too clayey	0.50
Bf:							
Bates	85	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Too clayey	0.50			Too clayey	0.50
Bm:							
Bates	50	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Too clayey	0.50			Too clayey	0.50
Collinsville	35	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Seepage	1.00	Slope	0.16	Seepage	0.50
		Slope	0.16			Slope	0.16
Bo:							
Bolivar	65	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Seepage	1.00	Slope	0.63	Slope	0.63
		Slope	0.63			Too clayey	0.50
		Too clayey	0.50				
Hector	25	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Seepage	1.00	Slope	0.63	Slope	0.63
		Slope	0.63			Seepage	0.50
Br:							
Brazilton	100	Very limited		Not limited		Very limited	
		Too clayey	1.00			Too clayey	1.00
Cd:							
Catoosa	90	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Seepage	1.00			Hard to compact	1.00
		Too clayey	0.50			Too clayey	0.50
Ch:							
Cherokee	100	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Too clayey	1.00
		Too clayey	1.00			Depth to saturated zone	1.00
						Hard to compact	1.00
De:							
Dennis	90	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Too clayey	1.00
		Too clayey	1.00			Depth to saturated zone	1.00
						Hard to compact	1.00
Ef:							
Eram	85	Very limited		Very limited		Very limited	

SANITARY FACILITIES--Continued
Labette County, Kansas

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Too clayey	1.00
		Too clayey	1.00			Depth to saturated zone	1.00
						Hard to compact	1.00
Eh:							
Eram	88	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Too clayey	1.00
		Too clayey	1.00			Depth to saturated zone	1.00
						Hard to compact	1.00
Eo:							
Eram	60	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Too clayey	1.00
		Too clayey	1.00	Slope	0.00	Depth to saturated zone	1.00
		Slope	0.00			Hard to compact	1.00
						Slope	0.00
Lebo	20	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Slope	0.63	Slope	0.63	Slope	0.63
		Too clayey	0.50			Too clayey	0.50
Es:							
Eram	50	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Too clayey	1.00
		Too clayey	1.00			Depth to saturated zone	1.00
						Hard to compact	1.00
Nowata	30	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Too clayey	0.50			Too clayey	0.50
						Gravel content	0.09
He:							
Hepler	95	Very limited		Very limited		Somewhat limited	
		Flooding	1.00	Flooding	1.00	Depth to saturated zone	0.86
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Too clayey	0.50
		Too clayey	0.50				
HF:							
Hepler	95	Very limited		Very limited		Somewhat limited	
		Flooding	1.00	Flooding	1.00	Depth to saturated zone	0.86
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Too clayey	0.50
		Too clayey	0.50				
Ka:							
Kanima	100	Somewhat limited		Not limited		Somewhat limited	
		Too clayey	0.50			Too clayey	0.50
Kb:							
Kanima	95	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Too clayey	0.50			Too clayey	0.50
Ke:							
Kenoma	85	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Too clayey	1.00
		Too clayey	1.00			Depth to saturated zone	1.00
						Hard to compact	1.00
Ln:							
Lanton	95	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Too clayey	0.50
		Too clayey	0.50				
M-W:							
Miscellaneous Water-	100	Not rated		Not rated		Not rated	
Od:							
Olpe	50	Somewhat limited		Not limited		Somewhat limited	
		Too clayey	0.50			Too clayey	0.50
						Gravel content	0.21
Dennis	35	Very limited		Very limited		Very limited	

SANITARY FACILITIES--Continued
Labette County, Kansas

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Too clayey	1.00
		Too clayey	1.00			Depth to saturated zone	1.00
						Hard to compact	1.00
Or:							
Orthents	100	Very limited		Not limited		Very limited	
		Too clayey	1.00			Too clayey	1.00
						Hard to compact	1.00
Os:							
Osage	93	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Ponding	1.00	Depth to saturated zone	1.00
		Ponding	1.00	Depth to saturated zone	1.00	Too clayey	1.00
		Too clayey	1.00			Hard to compact	1.00
Pe:							
Parsons	91	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Too clayey	1.00
		Too clayey	1.00			Depth to saturated zone	1.00
Pt:							
Pits, Quarries	100	Not rated		Not rated		Not rated	
Sd:							
Shidler	50	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Seepage	1.00				
Catoosa	35	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Too clayey	1.00			Too clayey	1.00
		Seepage	1.00			Hard to compact	1.00
Vc:							
Verdigris	85	Very limited		Very limited		Not limited	
		Flooding	1.00	Flooding	1.00		
Vf:							
Verdigris	95	Very limited		Very limited		Not limited	
		Flooding	1.00	Flooding	1.00		
W:							
Water	100	Not rated		Not rated		Not rated	
Zb:							
Zaar	85	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Too clayey	1.00
		Too clayey	1.00			Depth to saturated zone	1.00
						Hard to compact	1.00

AGRICULTURAL WASTE MANAGEMENT
Labette County, Kansas

The nature of the soil is also important in the application of organic wastes and wastewater to land as fertilizers and irrigation; it is also important when the soil is used as a medium for treatment and disposal of these wastes. Favorable soil properties are required to prevent environmental damage.

The use of organic wastes and wastewater as production resources will result in energy conservation, prevent the waste of these important resources, and prevent problems associated with their disposal. Where disposal is the goal, and a maximum amount is disposed in a minimum area to hold costs to a minimum, risk of environmental damage is the principal constraint. Where the reuse goal is pursued, and a minimum amount is applied to a maximum area to obtain the greatest benefit, environmental damage is unlikely.

Interpretations developed for waste management may include ratings for (1) manure and food processing wastes; (2) municipal sewage sludge; (3) irrigation use of wastewater; or (4) treatment of wastewater by the slow rate process, overland flow process, or rapid infiltration process. If available, these should be located in this subsection.

Soil properties are important considerations in areas where soils are used as sites for the treatment and disposal of organic waste and wastewater. Selection of soils with properties that favor waste management can help to prevent environmental damage.

The Ag–Waste tables show the degree and kind of soil limitations affecting the treatment of agricultural waste, including municipal and food–processing wastewater and effluent from lagoons or storage ponds. Municipal wastewater is the waste stream from a municipality. It contains domestic waste and may contain industrial waste. It may have received primary or secondary treatment. It is rarely untreated sewage. Food–processing wastewater results from the preparation of fruits, vegetables, milk, cheese, and meats for public consumption. In places it is high in content of sodium and chloride. In the context of these tables, the effluent in lagoons and storage ponds is from facilities used to treat or store food–processing wastewater or domestic or animal waste. Domestic and food–processing wastewater is very dilute, and the effluent from the facilities that treat or store it commonly is very low in content of carbonaceous and nitrogenous material; the content of nitrogen commonly ranges from 10 to 30 milligrams per liter. The wastewater from animal waste treatment lagoons or storage ponds, however, has much higher concentrations of these materials, mainly because the manure has not been diluted as much as the domestic waste. The content of nitrogen in this wastewater generally ranges from 50 to 2,000 milligrams per liter. When wastewater is applied, checks should be made to ensure that nitrogen, phosphorus, heavy metals, and salts are not added in excessive amounts.

The ratings in the tables are for waste management systems that not only dispose of and treat organic waste or wastewater but also are beneficial to crops (application of manure and food–processing waste, application of sewage sludge, and disposal of wastewater by irrigation)and for waste management systems that are designed only for the purpose of wastewater disposal and treatment (overland flow of wastewater, rapid infiltration of wastewater, and slow rate treatment of wastewater).

The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect agricultural waste management. Not limited indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. Slightly limited indicates that the soil has features that are generally favorable for the specified use. The limitations are minor and can be easily overcome. Good performance and low maintenance can be expected. Somewhat limited indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. Very limited indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the tables indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.00 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

Application of manure and food–processing waste not only disposes of waste material but also can improve crop production by increasing the supply of nutrients in the soils where the material is applied. Manure is the excrement of livestock and poultry, and food–processing waste is damaged fruit and vegetables and the peelings, stems, leaves, pits, and soil particles removed in food preparation. The manure and food–processing waste are either solid, slurry, or liquid. Their nitrogen content varies. A high content of nitrogen limits the application rate. Toxic or otherwise dangerous wastes, such as those mixed with the lye used in food processing, are not considered in the ratings.

The ratings are based on the soil properties that affect absorption, plant growth, microbial activity, erodibility, the rate at which the waste is applied, and the method by which the waste is applied. The properties that affect absorption include permeability, depth to a water table, ponding, the sodium adsorption ratio, depth to bedrock or a cemented pan, and available water capacity. The properties that affect plant growth and microbial activity include reaction, the sodium adsorption ratio, salinity, and bulk density.The wind erodibility group, the soil erodibility factor K, and slope are consideredin estimating the likelihood that wind erosion or water erosion will transport the waste material from the application site. Stones, cobbles, a water table, ponding, and flooding can hinder the application of waste. Permanently frozen soils are unsuitable for waste treatment.

Application of sewage sludge not only disposes of waste material but also can improve crop production by increasing the supply of nutrients in the soils where the material is applied. In the context of this table, sewage sludge is the residual product of the treatment of municipal sewage. The solid component consists mainly of cell mass, primarily bacteria cells that developed during secondary treatment and have incorporated soluble organics into their own bodies. The sludge has small amounts of sand, silt, and other solid debris. The content of nitrogen varies. Some sludge has constituents that are toxic to plants or hazardous to the food chain, such as heavy metals and exotic organic compounds, and should be analyzed chemically prior to use.

AGRICULTURAL WASTE MANAGEMENT
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The content of water in the sludge ranges from about 98 percent to less than 40 percent. The sludge is considered liquid if it is more than about 90 percent water, slurry if it is about 50 to 90 percent water, and solid if it is less than about 50 percent water.

The ratings in the table are based on the soil properties that affect absorption, plant growth, microbial activity, erodibility, the rate at which the sludge is applied, and the method by which the sludge is applied. The properties that affect absorption, plant growth, and microbial activity include permeability, depth to a water table, ponding, the sodium adsorption ratio, depth to bedrock or a cemented pan, available water capacity, reaction, salinity, and bulk density. The wind erodibility group, the soil erodibility factor K, and slope are considered in estimating the likelihood that wind erosion or water erosion will transport the waste material from the application site. Stones, cobbles, a water table, ponding, and flooding can hinder the application of sludge. Permanently frozen soils are unsuitable for waste treatment.

Disposal of wastewater by irrigation not only disposes of municipal wastewater and wastewater from food-processing plants, lagoons, and storage ponds but also can improve crop production by increasing the amount of water available to crops. The ratings in the table are based on the soil properties that affect the design, construction, management, and performance of the irrigation system. The properties that affect design and management include the sodium adsorption ratio, depth to a water table, ponding, available water capacity, permeability, slope, and flooding. The properties that affect construction include stones, cobbles, depth to bedrock or a cemented pan, depth to a water table, and ponding.

The properties that affect performance include depth to bedrock or a cemented pan, bulk density, the sodium adsorption ratio, salinity, reaction, and the cation-exchange capacity, which is used to estimate the capacity of a soil to adsorb heavy metals. Permanently frozen soils are not suitable for disposal of wastewater by irrigation.

See the National Soil Handbook, September 1992, Part 620, for criteria used in rating soils for sanitary facilities and waste management.

AGRICULTURAL WASTE MANAGEMENT--Continued
Labette County, Kansas

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.00 to 1.00. The larger the value, the greater the potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Application of manure and food-processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
021ES:							
Eram	50	Very limited		Very limited		Very limited	
		Restricted permeability	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Restricted permeability	1.00	Restricted permeability	1.00
		Depth to bedrock	0.80	Depth to bedrock	0.80	Too steep for surface application	1.00
		Droughty	0.77	Droughty	0.77	Depth to bedrock	0.80
		Slope	0.04	Too acid	0.07	Droughty	0.77
Shidler	40	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Droughty	1.00	Droughty	1.00
		Droughty	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Runoff limitation	0.40	Restricted permeability	0.22	Too steep for surface application	0.66
		Restricted permeability	0.30			Restricted permeability	0.22
						Too steep for sprinkler application	0.00
125BF:							
Bates	50	Somewhat limited		Somewhat limited		Somewhat limited	
		Depth to bedrock	0.35	Depth to bedrock	0.35	Depth to bedrock	0.35
		Restricted permeability	0.30	Restricted permeability	0.22	Restricted permeability	0.22
		Droughty	0.05	Too acid	0.07	Too acid	0.07
		Too acid	0.02	Droughty	0.05	Droughty	0.05
Collinsville	40	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Droughty	1.00	Droughty	1.00
		Droughty	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Runoff limitation	0.40	Too acid	0.77	Too acid	0.77
		Too acid	0.22	Filtering capacity	0.00	Filtering capacity	0.00
		Filtering capacity	0.00			Too steep for surface application	0.00
Ae:							
Apperson	85	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
		Too acid	0.03	Too acid	0.14	Too acid	0.14
AED:							
Arents, Earthen Dam	100	Not rated		Not rated		Not rated	
Be:							
Bates	85	Somewhat limited		Somewhat limited		Somewhat limited	
		Restricted permeability	0.89	Restricted permeability	0.78	Restricted permeability	0.78
		Depth to bedrock	0.46	Depth to bedrock	0.46	Depth to bedrock	0.46
		Droughty	0.30	Too acid	0.42	Too acid	0.42
		Too acid	0.11	Droughty	0.30	Droughty	0.30
Bf:							
Bates	85	Somewhat limited		Somewhat limited		Somewhat limited	
		Restricted permeability	0.89	Depth to bedrock	0.80	Depth to bedrock	0.80
		Depth to bedrock	0.80	Restricted permeability	0.78	Restricted permeability	0.78
		Droughty	0.72	Droughty	0.72	Droughty	0.72
		Too acid	0.11	Too acid	0.42	Too acid	0.42
						Too steep for surface application	0.31
Bm:							
Bates	50	Somewhat limited		Somewhat limited		Somewhat limited	
		Restricted permeability	0.89	Restricted permeability	0.78	Restricted permeability	0.78
		Depth to bedrock	0.71	Depth to bedrock	0.71	Depth to bedrock	0.71
		Droughty	0.67	Droughty	0.67	Droughty	0.67
		Too acid	0.11	Too acid	0.42	Too steep for surface application	0.66
						Too acid	0.42

AGRICULTURAL WASTE MANAGEMENT--Continued
Labette County, Kansas

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.00 to 1.00. The larger the value, the greater the potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Application of manure and food-processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Collinsville--------	35	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Droughty	1.00	Droughty	1.00
		Droughty	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Runoff limitation	0.40	Too acid	0.77	Too steep for surface application	1.00
		Too acid	0.22	Slope	0.16	Too acid	0.77
		Slope	0.16	Filtering capacity	0.00	Too steep for sprinkler application	0.39
Bo:							
Bolivar----------	65	Somewhat limited		Somewhat limited		Very limited	
		Droughty	0.98	Droughty	0.98	Too steep for surface application	1.00
		Depth to bedrock	0.71	Depth to bedrock	0.71	Droughty	0.98
		Slope	0.63	Slope	0.63	Too steep for sprinkler application	0.77
		Too acid	0.11	Too acid	0.42	Depth to bedrock	0.71
		Filtering capacity	0.00	Filtering capacity	0.00	Too acid	0.42
Hector----------	25	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Droughty	1.00	Droughty	1.00
		Droughty	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Slope	0.63	Slope	0.63	Too steep for surface application	1.00
		Runoff limitation	0.40	Too acid	0.42	Too steep for sprinkler application	0.77
		Too acid	0.11	Low adsorption	0.00	Too acid	0.42
Br:							
Brazilton----------	100	Very limited		Very limited		Very limited	
		Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
		Runoff limitation	0.40	Too acid	0.07	Too acid	0.07
		Too acid	0.02			Too steep for surface application	0.00
Cd:							
Catoosa----------	90	Somewhat limited		Somewhat limited		Somewhat limited	
		Restricted permeability	0.30	Restricted permeability	0.22	Restricted permeability	0.22
		Too acid	0.03	Too acid	0.14	Too acid	0.14
		Depth to bedrock	0.01	Depth to bedrock	0.01	Depth to bedrock	0.01
Ch:							
Cherokee----------	100	Very limited		Very limited		Very limited	
		Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Runoff limitation	0.40	Too acid	0.31	Too acid	0.31
		Too acid	0.08				
De:							
Dennis----------	90	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
		Too acid	0.18	Too acid	0.67	Too acid	0.67
Ef:							
Eram----------	85	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
		Droughty	0.95	Droughty	0.95	Droughty	0.95
		Depth to bedrock	0.80	Depth to bedrock	0.80	Depth to bedrock	0.80
		Too acid	0.03	Too acid	0.14	Too acid	0.14
Eh:							
Eram----------	88	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
		Droughty	0.89	Droughty	0.89	Droughty	0.89
		Depth to bedrock	0.65	Depth to bedrock	0.65	Depth to bedrock	0.65

AGRICULTURAL WASTE MANAGEMENT--Continued
Labette County, Kansas

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.00 to 1.00. The larger the value, the greater the potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Application of manure and food-processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
		Too acid	0.03	Too acid	0.14	Too steep for surface application	0.31
Eo:							
Eram	60	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
		Droughty	0.88	Droughty	0.88	Too steep for surface application	1.00
		Depth to bedrock	0.65	Depth to bedrock	0.65	Droughty	0.88
		Too acid	0.03	Too acid	0.14	Depth to bedrock	0.65
Lebo	20	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Too steep for surface application	1.00
		Droughty	0.58	Droughty	0.58	Too steep for sprinkler application	0.77
		Depth to bedrock	0.29	Depth to bedrock	0.29	Droughty	0.58
						Depth to bedrock	0.29
Es:							
Eram	50	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
		Droughty	0.89	Droughty	0.89	Droughty	0.89
		Depth to bedrock	0.65	Depth to bedrock	0.65	Depth to bedrock	0.65
		Too acid	0.03	Too acid	0.14	Too steep for surface application	0.31
Nowata	30	Somewhat limited		Somewhat limited		Somewhat limited	
		Droughty	0.59	Droughty	0.59	Droughty	0.59
		Restricted permeability	0.30	Restricted permeability	0.22	Too steep for surface application	0.31
		Depth to bedrock	0.06	Too acid	0.14	Restricted permeability	0.22
		Too acid	0.03	Depth to bedrock	0.06	Too acid	0.14
						Depth to bedrock	0.06
He:							
Hepler	95	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Flooding	1.00	Depth to saturated zone	1.00
		Flooding	0.60	Depth to saturated zone	1.00	Too acid	0.77
		Restricted permeability	0.30	Too acid	0.77	Flooding	0.60
		Too acid	0.22	Restricted permeability	0.22	Restricted permeability	0.22
HF:							
Hepler	95	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Restricted permeability	0.30	Restricted permeability	0.22	Restricted permeability	0.22
		Too acid	0.01	Too acid	0.03	Too acid	0.03
Ka:							
Kanima	100	Very limited		Somewhat limited		Somewhat limited	
		Depth to dense layer	1.00	Droughty	0.43	Droughty	0.43
		Droughty	0.43			Too steep for surface application	0.31
Kb:							
Kanima	95	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Too steep for surface application	1.00
		Depth to dense layer	1.00	Droughty	0.43	Too steep for sprinkler application	1.00
		Droughty	0.43			Droughty	0.43

AGRICULTURAL WASTE MANAGEMENT--Continued
Labette County, Kansas

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.00 to 1.00. The larger the value, the greater the potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Application of manure and food-processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Ke:							
Kenoma	85	Very limited		Very limited		Very limited	
		Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Runoff limitation	0.40	Too acid	0.42	Too acid	0.42
		Too acid	0.11				
Ln:							
Lanton	95	Very limited		Very limited		Very limited	
		Restricted permeability	1.00	Flooding	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Restricted permeability	1.00
		Flooding	0.60	Restricted permeability	1.00	Flooding	0.60
		Too acid	0.03	Too acid	0.14	Too acid	0.14
M-W:							
Miscellaneous Water-	100	Not rated		Not rated		Not rated	
Od:							
Olpe	50	Very limited		Very limited		Very limited	
		Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
		Droughty	0.83	Droughty	0.83	Droughty	0.83
		Too acid	0.11	Too acid	0.42	Too acid	0.42
						Too steep for surface application	0.31
Dennis	35	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
		Too acid	0.18	Too acid	0.67	Too acid	0.67
						Too steep for surface application	0.31
Or:							
Orthents	100	Very limited		Very limited		Very limited	
		Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
		Depth to dense layer	1.00	Droughty	0.01	Droughty	0.01
		Runoff limitation	0.40				
		Droughty	0.01				
Os:							
Osage	93	Very limited		Very limited		Very limited	
		Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Flooding	0.60	Flooding	1.00	Flooding	0.60
		Runoff limitation	0.40				
Pe:							
Parsons	91	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
		Runoff limitation	0.40	Too acid	0.03	Too acid	0.03
		Too acid	0.01				
Pt:							
Pits, Quarries	100	Not rated		Not rated		Not rated	
Sd:							
Shidler	50	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Droughty	1.00	Droughty	1.00
		Droughty	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Runoff limitation	0.40			Too steep for surface application	0.31
Catoosa	35	Somewhat limited		Somewhat limited		Somewhat limited	

AGRICULTURAL WASTE MANAGEMENT--Continued
Labette County, Kansas

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.00 to 1.00. The larger the value, the greater the potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Application of manure and food-processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
		Restricted permeability	0.30	Restricted permeability	0.22	Too steep for surface application	0.31
		Too acid	0.03	Too acid	0.14	Restricted permeability	0.22
		Depth to bedrock	0.01	Depth to bedrock	0.01	Too acid	0.14
						Depth to bedrock	0.01
Vc:							
Verdigris	85	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
Vf:							
Verdigris	95	Somewhat limited		Very limited		Somewhat limited	
		Flooding	0.60	Flooding	1.00	Flooding	0.60
W:							
Water	100	Not rated		Not rated		Not rated	
Zb:							
Zaar	85	Very limited		Very limited		Very limited	
		Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Runoff limitation	0.40				

WIN-PST SPISP II
SOIL SENSITIVITY TO PESTICIDE LOSS RATING REPORT

Soils Data Table: SOIL_KS Sort Order: MUSYM

Labette County, Kansas: KS099

MUSYM/SEQ#	COMPONENT/TEXTURE/MU%	HYD	KFACT	SURFACE DEPTH	% OM	SPISP II Ratings: Leaching (SLP)	Solution Runoff (SSRP)	Adsorbed Runoff (SARP)
021ES 1	ERAM SICL 50%	C	0.37	8"	2.0%	H (w)	H	H
021ES 2	SHIDLER SICL 40%	D	0.32	12"	3.0%	V	H	H
125BF 1	BATES L 50%	B	0.32	9"	2.5%	I	I	I
125BF 2	COLLINSVILLE FSL 40%	D	0.20	11"	2.0%	V	H	H
Ae 1	APPERSON SICL 85%	C	0.37	7"	2.0%	H (w)	H	H
AED 1	ARENTS, EARTHEN DAM 100%		0.00	0"	0.0%	?	?	?
Be 1	BATES L 85%	B	0.32	9"	2.0%	I	I	I
Bf 1	BATES L 85%	B	0.32	7"	2.0%	I	I	I
Bm 1	BATES L 50%	B	0.32	8"	2.0%	I	I	I
Bm 2	COLLINSVILLE FSL 35%	D	0.20	8"	2.0%	V	H	H
Bo 1	BOLIVAR FSL 65%	B	0.24	5"	1.3%	H	I	H (s)
Bo 2	HECTOR FSL 25%	D	0.24	3"	1.3%	V	H	H (s)
Br 1	BRAZILTON SICL 100%	D	0.37	15"	2.5%	V	H	H
Cd 1	CATOOSA SIL 90%	B	0.37	12"	2.5%	I	I	I
Ch 1	CHEROKEE SIL 100%	D	0.49	7"	1.3%	H (w)	H	H
De 1	DENNIS SIL 90%	C	0.43	10"	2.5%	H (w)	H	H
Ef 1	ERAM SICL 85%	C	0.37	8"	2.5%	H (w)	H	H
Eh 1	ERAM SICL 88%	C	0.37	7"	2.0%	H (w)	H	H
Eo 1	ERAM SICL 60%	C	0.37	8"	2.0%	H (w)	H	H
Eo 2	LEBO SICL 20%	B	0.32	9"	2.0%	I	I	I
Es 1	ERAM SICL 50%	C	0.37	7"	2.0%	H (w)	H	H
Es 2	NOWATA SIL 30%	B	0.37	8"	2.0%	I	I	I
He 1	HEPLER SIL 95%	C	0.37	9"	0.8%	H (w)	H	H
HF 1	HEPLER SIL 95%	C	0.37	10"	0.8%	H (w)	H	H
Ka 1	KANIMA SICL 100%	C	0.28	6"	1.3%	L	H	H
Kb 1	KANIMA SICL 95%	C	0.28	6"	1.3%	L	H	H (s)
Ke 1	KENOMA SIL 85%	D	0.43	6"	3.0%	H (w)	H	H

WIN-PST SPISP II
SOIL SENSITIVITY TO PESTICIDE LOSS RATING REPORT

Soils Data Table: SOIL_KS Sort Order: MUSYM

Labette County, Kansas: KS099

Ln 1	LANTON SIL 95%	C	0.37	8"	3.0% H (w)	H	H
M-W 1	MISCELLANEOUS WATER 100%		0.00	0"	0.0% ?	?	?
Od 1	OLPE SIL 50%	C	0.43	7"	1.5% L	H	H
Od 2	DENNIS SIL 35%	C	0.43	10"	2.0% H (w)	H	H
Or 1	ORTHENTS SIC 100%	D	0.32	17"	0.5% V	H	H
Os 1	OSAGE SIC 93%	D	0.28	12"	2.5% H (w)	H	H
Pe 1	PARSONS SIL 91%	D	0.49	8"	1.3% H (w)	H	H
Pt 1	Pits, quarries VAR 100%		0.00	60"	0.0% ?	?	?
Sd 1	SHIDLER SIL 50%	D	0.32	12"	3.0% V	H	H
Sd 2	CATOOSA SIL 35%	B	0.37	12"	2.5% I	I	I
Vc 1	VERDIGRIS SIL 85%	B	0.32	11"	3.0% I	I	I
Vf 1	VERDIGRIS SIL 95%	B	0.32	34"	3.0% L	I	I
W 1	WATER 100%		0.00	0"	0.0% ?	?	?
Zb 1	ZAAR SIC 85%	D	0.28	7"	3.0% H (w)	H	H

(.\REPORTS\SOILS.TXT generated on 12/12/01 at 12:11:15)

H -- High
I -- Intermediate
L -- Low
V -- Very Low

Conditions that affect ratings:
    m   -- There are macropores in the surface horizon deeper than 24"
    w   -- The high water table comes within 24" of the surface during the growing season
    s   -- The field slope is greater than 15%

SPISP II S-Ratings:
   SLP   -- Soil Leaching Potential
   SSRP -- Soil Solution Runoff Potential
   SARP -- Soil Adsorbed Runoff Potential

HYDRIC SOIL INTERPRETATIONS
HYDRIC SOILS LIST
Labette County, Kansas

In this section, hydric soils are defined and described and the hydric soils in the survey area are listed. The three essential characteristics of wetlands are hydrophytic vegetation, hydric soils, and wetland hydrology (Cowardin and others, 1979; U.S. Army Corps of Engineers, 1987; National Research Council, 1995; Tiner, 1985). Criteria for each of the characteristics must be met for areas to be identified as wetlands. Undrained hydric soils that have natural vegetation should support a dominant population of ecological wetland plant species. Hydric soils that have been converted to other uses should be capable of being restored to wetlands.

Hydric soils are defined by the National Technical Committee for Hydric Soils (NTCHS) as soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part (Federal Register, 1994). These soils are either saturated or inundated long enough during the growing season to support the growth and reproduction of hydrophytic vegetation.

The NTCHS definition identifies general soil properties that are associated with wetness. In order to determine whether a specific soil is a hydric soil or nonhydric soil, however, more specific information, such as information about the depth and duration of the water table, is needed. Thus, criteria that identify those estimated soil properties unique to hydric soils have been established (Federal Register, 1995). These criteria are used to identify a phase of a soil series that normally is associated with wetlands. The criteria used are selected estimated soil properties that are described in "Soil Taxonomy" (USDA, 1999) and "Keys to Soil Taxonomy"’ (USDA, 1998) and in the "Soil Survey Manual" (USDA, 1993).

If soils are wet enough for a long enough period to be considered hydric, they should exhibit certain properties that can be easily observed in the field. These visible properties are indicators of hydric soils. The indicators used to make onsite determinations of hydric soils in this survey area are specified in "Field Indicators of Hydric Soils in the United States" (Hurt and others, 1996).

Hydric soils are identified by examining and describing the soil to a depth of about 20 inches. This depth may be greater if determination of an appropriate indicator so requires. It is always recommended that soils be excavated and described to the depth necessary for an understanding of the redoximorphic processes. Then, using the completed soil descriptions, soil scientists can compare the soil features required by each indicator and specify which indicators have been matched with the conditions observed in the soil. The soil can be identified as a hydric soil if at least one of the approved indicators is present.

Map units in the Hydric Soil Interpretations table meet the definition of hydric soils and, in addition, have at east one of the hydric soil indicators. This list can help in planning land uses; however, onsite investigation is recommended to determine the hydric soils on a specific site (National Research Council, 1995; Hurt and others, 1996).

Map units that are made up of hydric soils may have small areas, or inclusions, of nonhydric soils in the higher positions on the landform, and map units made up of nonhydric soils may have inclusions of hydric soils in the lower positions on the landform.

These map units, in general, do not meet the definition of hydric soils because they do not have one of the hydric soil indicators. A portion of these map units, however, may include hydric soils. Onsite investigation is recommended to determine whether hydric soils occur and the location of the included hydric soils.

HYDRIC SOIL INTERPRETATIONS
HYDRIC SOILS LIST
Labette County, Kansas

All mapunits are displayed regardless of hydric status and are listed in alpha-numeric order by mapunit symbol. The "Hydric Soils Criteria" columns indicate the conditions that caused the mapunit component to be classified as "Hydric" or "Non-Hydric". These criteria are defined in "Hydric Soils of the United States" (USDA Miscellaneous Publication No. 1491, June, 1991). See the "Criteria for Hydric Soils" endnote to determine the meaning of these columns. Spot symbols are footnoted at the end of the table.

Map symbol and map unit name	Component	Hydric	Local landform	Hydric soils criteria			
				Hydric criteria code	Meets saturation criteria	Meets flooding criteria	Meets ponding criteria
021ES:							
ERAM-SHIDLER SILTY CLAY LOAMS, 4 TO 12 PERCENT SLOPES	ERAM	No	ridge	---	---	---	---
	SHIDLER	No	hillslope	---	---	---	---
	DENNIS	No	hillslope	---	---	---	---
	ZAAR	No	hillslope	---	---	---	---
125BF:							
BATES-COLLINSVILLE COMPLEX, 1 TO 4 PERCENT SLOPES	BATES	No	ridge	---	---	---	---
	COLLINSVILLE	No	ridge	---	---	---	---
	ERAM	No	ridge	---	---	---	---
	TALIHINA	No	ridge	---	---	---	---
Ae:							
APPERSON SILTY CLAY LOAM, 1 TO 3 PERCENT SLOPES	APPERSON	No	ridge	---	---	---	---
	CATOOSA	No	ridge	---	---	---	---
	SHIDLER	No	hillslope	---	---	---	---
AED:							
ARENTS, EARTHEN DAM	ARENTS, EARTHEN DAM	Unranked	---	---	---	---	---
Be:							
BATES LOAM, 1 TO 3 PERCENT SLOPES	BATES	No	hillslope	---	---	---	---
	COLLINSVILLE	No	hillslope	---	---	---	---
	DENNIS	No	hillslope	---	---	---	---
Bf:							
BATES LOAM, 3 TO 7 PERCENT SLOPES	BATES	No	hillslope	---	---	---	---
	COLLINSVILLE	No	hillslope	---	---	---	---
	DENNIS	No	hillslope	---	---	---	---
Bm:							
BATES-COLLINSVILLE COMPLEX, 4 TO 15 PERCENT SLOPES	BATES	No	hillslope	---	---	---	---
	COLLINSVILLE	No	hillslope	---	---	---	---
	DENNIS	No	hillslope	---	---	---	---
	ERAM	No	hillslope	---	---	---	---
Bo:							
BOLIVAR-HECTOR FINE SANDY LOAMS, 4 TO 20 PERCENT SLOPES	BOLIVAR	No	ridge	---	---	---	---
	HECTOR	No	ridge	---	---	---	---
	DENNIS	No	hillslope	---	---	---	---
Br:							
BRAZILTON SILTY CLAY LOAM, 1 TO 4 PERCENT SLOPES	BRAZILTON	No	hillslope	---	---	---	---
Cd:							
CATOOSA SILT LOAM, 0 TO 2 PERCENT SLOPES	CATOOSA	No	ridge	---	---	---	---
	APPERSON	No	ridge	---	---	---	---
	KENOMA	No	hillslope	---	---	---	---
	ROCK OUTCROP	Unranked	hillslope	---	---	---	---
	SHIDLER	No	hillslope	---	---	---	---
	ZAAR	No	hillslope	---	---	---	---
Ch:							
CHEROKEE SILT LOAM, 0 TO 1 PERCENT SLOPES	CHEROKEE	No	paleoterrace	---	---	---	---
De:							
DENNIS SILT LOAM, 1 TO 3 PERCENT SLOPES	DENNIS	No	hillslope	---	---	---	---
	BATES	No	hillslope	---	---	---	---
Ef:							
ERAM SILTY CLAY LOAM, 1 TO 3 PERCENT SLOPES	ERAM	No	hillslope	---	---	---	---
	BATES	No	hillslope	---	---	---	---
	ZAAR	No	hillslope	---	---	---	---
Eh:							
ERAM SILTY CLAY LOAM, 3 TO 7 PERCENT SLOPES	ERAM	No	hillslope	---	---	---	---
	BATES	No	hillslope	---	---	---	---
	LEBO	No	hillslope	---	---	---	---
	ZAAR	No	hillslope	---	---	---	---
Eo:							
ERAM-LEBO SILTY CLAY LOAMS, 4 TO 20 PERCENT SLOPES	ERAM	No	hillslope	---	---	---	---
	LEBO	No	hillslope	---	---	---	---
	COLLINSVILLE	No	hillslope	---	---	---	---
	ZAAR	No	hillslope	---	---	---	---

HYDRIC SOIL INTERPRETATIONS
HYDRIC SOILS LIST
Labette County, Kansas

All mapunits are displayed regardless of hydric status and are listed in alpha-numeric order by mapunit symbol. The "Hydric Soils Criteria" columns indicate the conditions that caused the mapunit component to be classified as "Hydric" or "Non-Hydric". These criteria are defined in "Hydric Soils of the United States" (USDA Miscellaneous Publication No. 1491, June, 1991). See the "Criteria for Hydric Soils" endnote to determine the meaning of these columns. Spot symbols are footnoted at the end of the table.

Map symbol and map unit name	Component	Hydric	Local landform	Hydric soils criteria			
				Hydric criteria code	Meets saturation criteria	Meets flooding criteria	Meets ponding criteria
Es:							
ERAM-NOWATA COMPLEX, 2 TO 7 PERCENT SLOPES	ERAM	No	hillslope	---	---	---	---
	NOWATA	No	ridge	---	---	---	---
	APPERSON	No	ridge	---	---	---	---
	DENNIS	No	hillslope	---	---	---	---
	SHIDLER	No	hillslope	---	---	---	---
He:							
HEPLER SILT LOAM, OCCASIONALLY FLOODED	HEPLER	No	flood plain	---	---	---	---
	OSAGE	Yes	flood plain	2B3	YES	NO	NO
HF:							
HEPLER SILT LOAM, FREQUENTLY FLOODED	HEPLER	No	flood plain	---	---	---	---
	OSAGE	Yes	flood plain	2B3	YES	NO	NO
Ka:							
KANIMA SILTY CLAY LOAM, 3 TO 7 PERCENT SLOPES	KANIMA	No	hillslope	---	---	---	---
Kb:							
KANIMA SILTY CLAY LOAM, 10 TO 30 PERCENT SLOPES	KANIMA	No	hillslope	---	---	---	---
	MISCELLANEOUS WATER	Unranked	---	---	---	---	---
Ke:							
KENOMA SILT LOAM, 1 TO 3 PERCENT SLOPES	KENOMA	No	hillslope	---	---	---	---
	CATOOSA	No	ridge	---	---	---	---
	ZAAR	No	hillslope	---	---	---	---
Ln:							
LANTON SILT LOAM, OCCASIONALLY FLOODED	LANTON	No	flood plain	---	---	---	---
	OSAGE	Yes	flood plain	2B3	YES	NO	NO
M-W:							
MISCELLANEOUS WATER	MISCELLANEOUS WATER	Unranked	---	---	---	---	---
Od:							
OLPE-DENNIS SILT LOAMS, 3 TO 7 PERCENT SLOPES	OLPE	No	paleoterrace	---	---	---	---
	DENNIS	No	hillslope	---	---	---	---
	ERAM	No	hillslope	---	---	---	---
	SHIDLER	No	hillslope	---	---	---	---
Or:							
ORTHENTS, CLAYEY	ORTHENTS	Unranked	hillslope	---	---	---	---
Os:							
OSAGE SILTY CLAY, OCCASIONALLY FLOODED	OSAGE	Yes	flood plain	2B3	YES	NO	NO
	HEPLER	No	flood plain	---	---	---	---
	LANTON	No	flood plain	---	---	---	---
	VERDIGRIS	No	flood plain	---	---	---	---
Pe:							
PARSONS SILT LOAM, 0 TO 2 PERCENT SLOPES	PARSONS	No	paleoterrace	---	---	---	---
	DENNIS	No	hillslope	---	---	---	---
	ZAAR	No	hillslope	---	---	---	---
Pt:							
PITS, QUARRIES	Pits, quarries	Unranked	---	---	---	---	---
Sd:							
SHIDLER-CATOOSA SILT LOAMS, 1 TO 8 PERCENT SLOPES	SHIDLER	No	hillslope	---	---	---	---
	Catoosa	No	ridge	---	---	---	---
	ERAM	No	hillslope	---	---	---	---
Vc:							
VERDIGRIS SILT LOAM, FREQUENTLY FLOODED	VERDIGRIS	No	flood plain	---	---	---	---
	ZAAR	No	hillslope	---	---	---	---
	ERAM	No	hillslope	---	---	---	---
Vf:							
VERDIGRIS SILT LOAM, OCCASIONALLY FLOODED	VERDIGRIS	No	flood plain	---	---	---	---
	OSAGE	Yes	flood plain	2B3	YES	NO	NO
W:							
WATER	WATER	Yes	---	3,4	NO	YES	YES
Zb:							
ZAAR SILTY CLAY, 0 TO 2 PERCENT SLOPES	ZAAR	No	hillslope	---	---	---	---
	PARSONS	No	paleoterrace	---	---	---	---
	VERDIGRIS	No	flood plain	---	---	---	---

HYDRIC SOIL INTERPRETATIONS
HYDRIC SOILS LIST
Labette County, Kansas

All mapunits are displayed regardless of hydric status and are listed in alpha-numeric order by mapunit symbol. The "Hydric Soils Criteria" columns indicate the conditions that caused the mapunit component to be classified as "Hydric" or "Non-Hydric". These criteria are defined in "Hydric Soils of the United States" (USDA Miscellaneous Publication No. 1491, June, 1991). See the "Criteria for Hydric Soils" endnote to determine the meaning of these columns. Spot symbols are footnoted at the end of the table.

Map symbol and map unit name	Component	Hydric	Local landform	Hydric soils criteria			
				Hydric criteria code	Meets saturation criteria	Meets flooding criteria	Meets ponding criteria

FOOTNOTE: There may be small areas of included soils or miscellaneous areas that are significant to use and management of the soil; yet are too small to delineate on the soil map at the map's original scale. These may be designated as spot symbols and are defined in the published Soil Survey Report or the USDA-NRCS Technical Guide, Part II.
Areas mapped as water or any map unit that contains one of the following conventional symbols is considered a hydric soil map unit: marshes or swamps; wet spots; depressions; streams, lakes and ponds.

1. All Histosols except Folists, or

2. Soils in Aquic suborders, great groups, or subgroups, Albolls suborder, Aquisalids, Pachic subgroups, or Cumulic subgroups that are:

   a. Somewhat poorly drained with a water table equal to 0.0 foot (ft) from the surface during the growing season, or

   b. poorly drained or very poorly drained and have either:

      (1) water table equal to 0.0 ft during the growing season if textures are coarse sand, sand, or fine sand in all layers within 20 inches (in),

      or for other soils

      (2) water table at less than or equal to 0.5 ft from the surface during the growing season if permeability is equal to or greater than 6.0 in/hour (h) in all layers within 20 in, or

      (3) water table at less than or equal to 1.0 ft from the surface during the growing season if permeability is less than 6.0 in/h in any layer within 20 in, or

3. Soils that are frequently ponded for long duration or very long duration during the growing season, or

4. Soils that are frequently flooded for long duration or very long duration during the growing season.